Electronic Supplementary Information

In Situ Polymerization and Covalent Functionalisation of Trithiocyanuric acid by MoS_2 Nanosheets Resulting in Novel Nanozyme with Enhanced Peroxidase Activity, S. Muralikrishna, M. Somasundrum,* W. Surareungchai,* *New Journal of Chemistry*, 2020, Feb. 18th.

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Table S1: Binding energy and atomic percentage of Mo 3d in MoS_2 NS

Element	B.E (eV)	FWHM	Area	Atomic%
Mo 3d :	226.667	1.762	6937.2	8.7
Mo 3d :	229.278	0.916	21306.3	26.7
Mo 3d :	230.354	1.541	10536.1	13.2
Mo 3d :	232.445	1.223	20596.0	25.8
Mo 3d :	233.661	1.348	14117.6	17.7
Mo 3d :	236.174	1.806	6324.0	7.9

Table S2: Binding energy and atomic percentage of Mo 3d in PTCA-MoS_2 NS

Element	B.E (eV)	FWHM	Area	Atomic%
Mo 3d :	227.059	2.263	20547.2	13.3
Mo 3d :	229.562	1.259	48793.5	31.6
Mo 3d :	230.903	1.259	19207.1	12.4
Mo 3d :	232.704	1.259	27124.2	17.6
Mo 3d :	233.844	1.803	31412.6	20.3
Mo 3d :	236.403	1.616	7434.4	4.8

Table S3: Binding energy and atomic percentage of S 2p in MoS_2 NS

Element	B.E (eV)	FWHM	Area	Atomic %
S 2p :	162.145	1.167	14114.2	51.7
S 2p :	163.431	1.116	10683.3	39.1
S 2p :	164.790	1.116	2509.3	9.2

Table S4: Binding energy and atomic percentage of S 2p in PTCA-MoS_2 NS

Element	B.E (eV)	FWHM	Area	Atomic %
S 2p :	162.432	1.475	24467.3	40.6
S 2p :	163.967	1.475	26182.5	43.5
S 2p :	165.379	1.475	9576.0	15.9

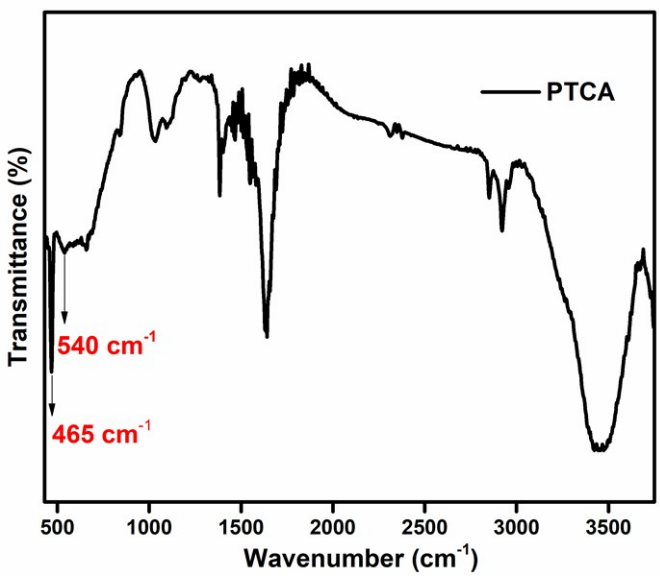


Figure S1: FT-IR spectrum of PTCA.

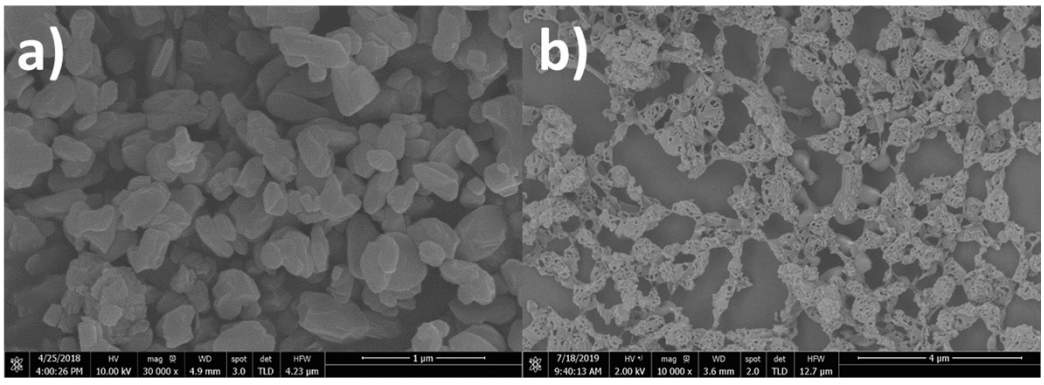


Figure S2: SEM image of (a) MoO_3 and (b) PTCA.

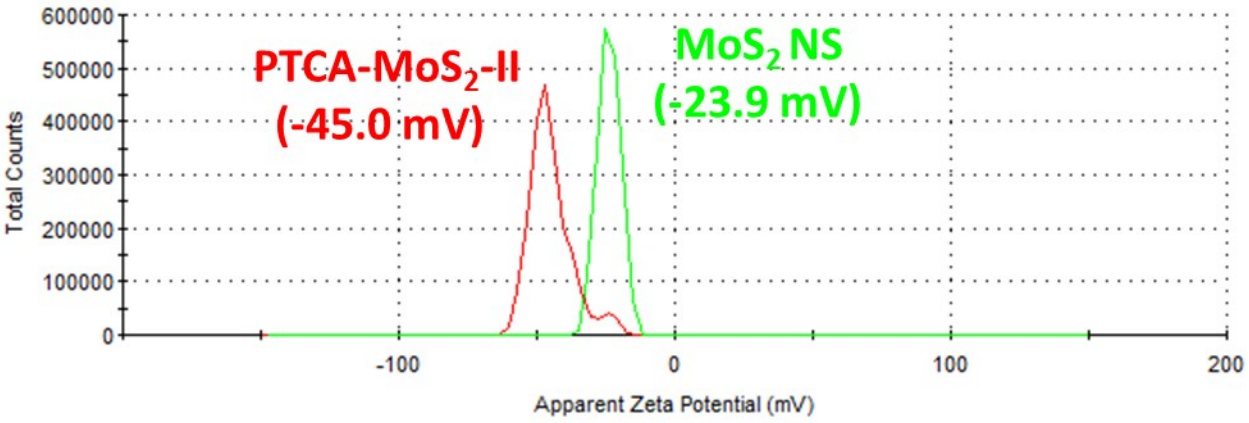


Figure S3: ζ-potential of PTCA-MoS_2-II and MoS_2 recorded in pH 3.5 Na-Ac buffer.

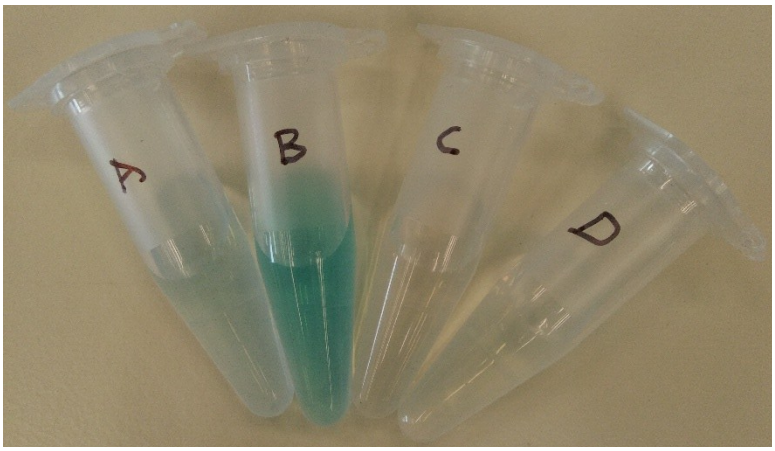


Figure S4: Optical photographic image for peroxidase activity (A) MoS_2 NS+TMB+H_2O_2 (B) PTCA-MoS_2 +TMB+H_2O_2 (C) PTCA-MoS_2 +TMB (D) TMB+H_2O_2 (Experimental condition: 1 mL of pH 3.5 Na-Ac buffer containing 40 µg catalyst, 1 mM TMB and 1 mM H_2O_2).

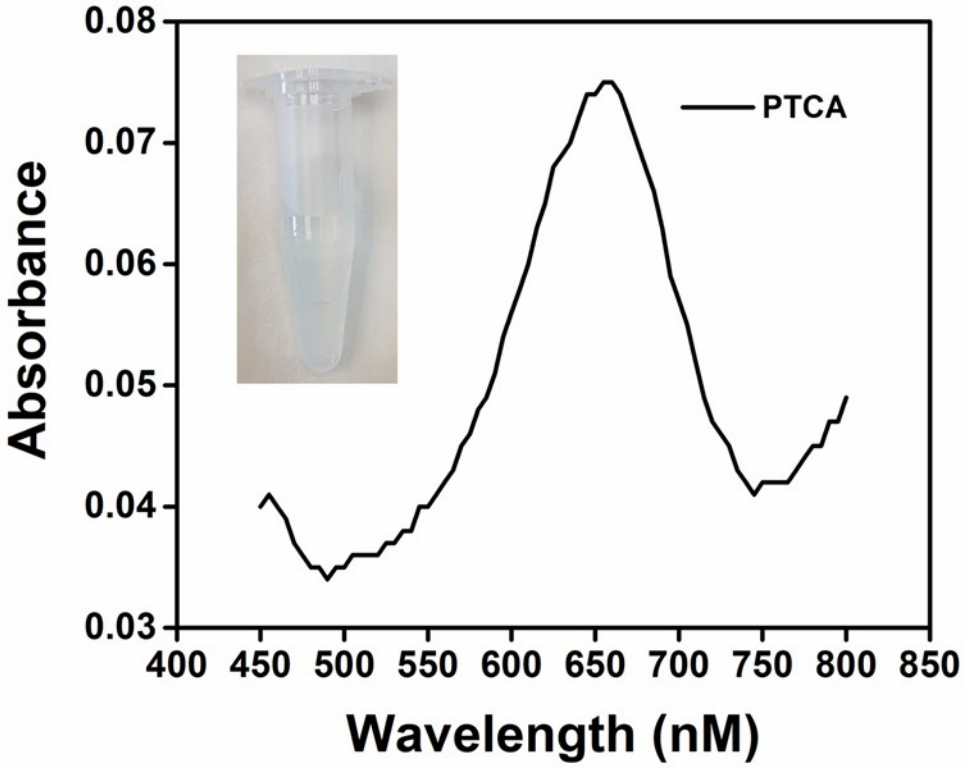


Figure S5: Absorbance spectrum for mimic peroxidase activity of PTCA (Experimental condition: 250 µL of each buffer solution contains 40 µg/mL PTCA, 1 mM TMB and 10 mM H_2O_2, incubation time 5 min. Inset: Optical photographic image for peroxidase activity with PTCA catalyst).

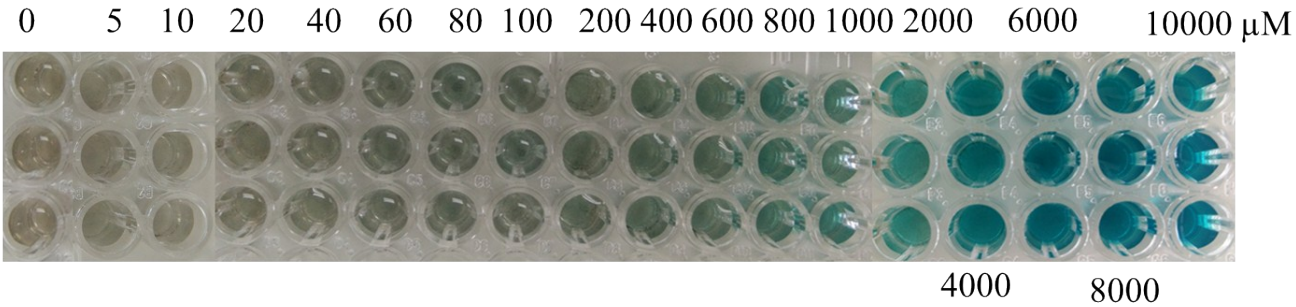


Figure S6: (a) Optical photographic image for H_2O_2 sensing PTCA-MoS_2 as nanozyme catalyst (Experimental condition: 250 µl of pH 3.5 Na-Ac buffer containing 40 µg/mL catalyst, 1 mM TMB with different concentration of H_2O_2, incubation time 5 min at room temperature)

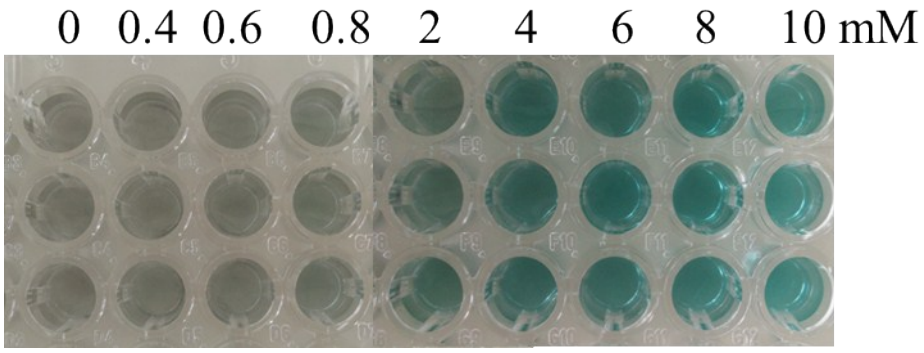
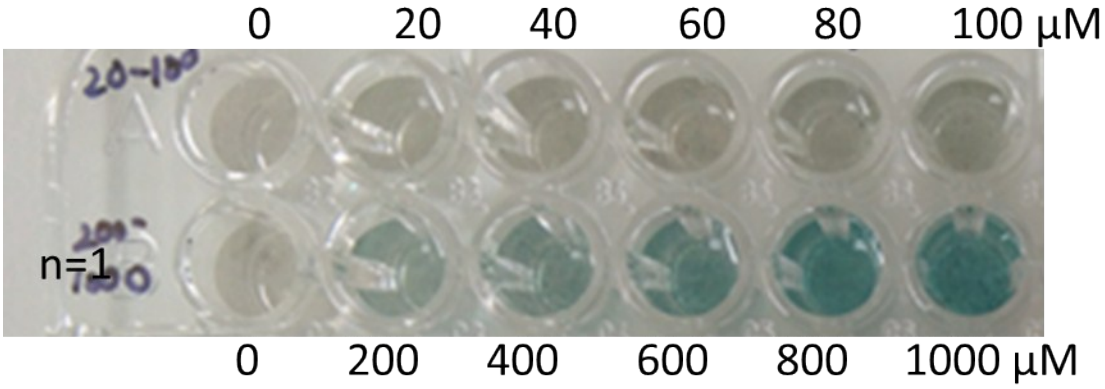
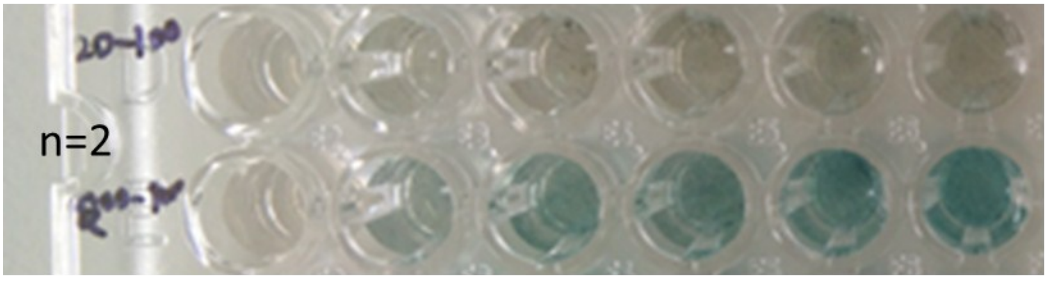


Figure S6: (**b**) Optical photographic image for H_2O_2 sensing MoS_2 NS as nanozyme catalyst (Experimental condition: 250 µl of pH 3.5 Na-Ac buffer containing 40 µg/mL catalyst, 1 mM TMB with different concentration of H_2O_2, incubation time 5 min at room temperature)





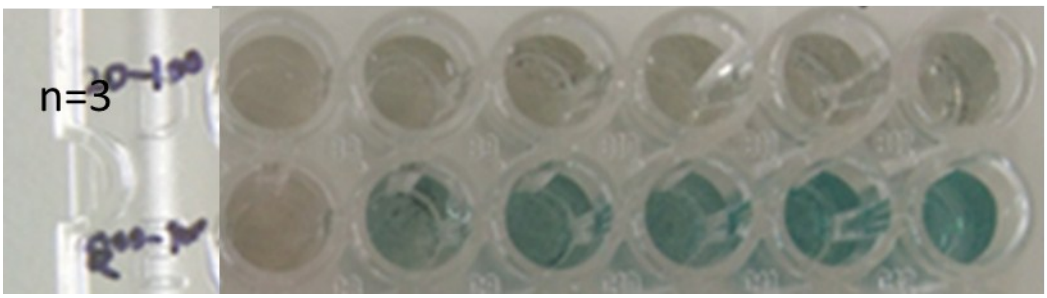


Figure S7 (a) Optical photographic image for glucose sensing using PTCA-MoS_2 as nanozyme catalyst (Experimental condition: 250 µl of pH 3.5 Na-Ac buffer containing 40 µg/mL catalyst, 1 mM TMB with different concentration of glucose in the presence of glucose oxidase, incubation time 15 min at room temperature).

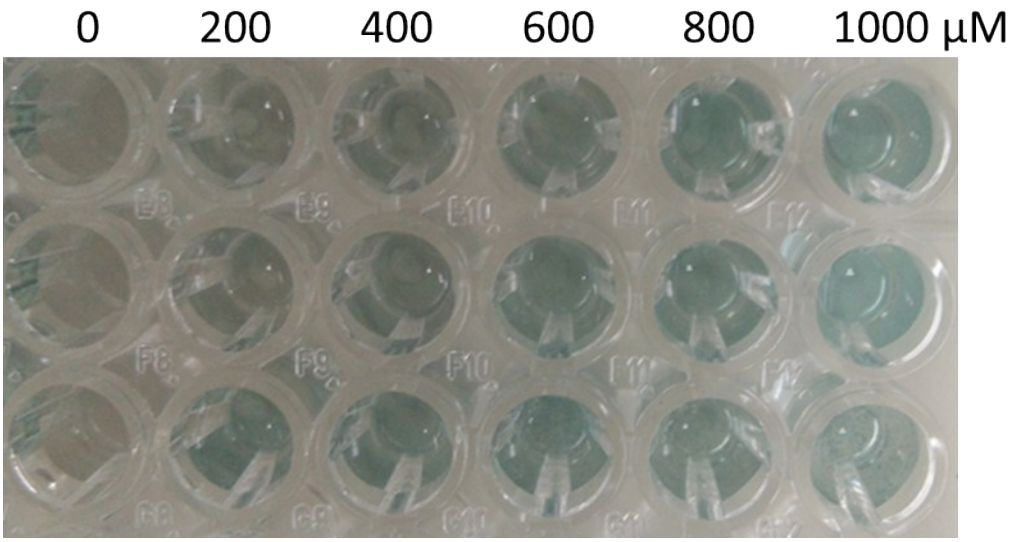


Figure S7 (b) Optical photographic image for glucose sensing using MoS_2 NS as nanozyme catalyst (Experimental condition: 250 µl of pH 3.5 Na-Ac buffer containing 40 µg/mL catalyst, 1 mM TMB with different concentration of glucose in the presence of glucose oxidase, incubation time 15 min at room temperature).

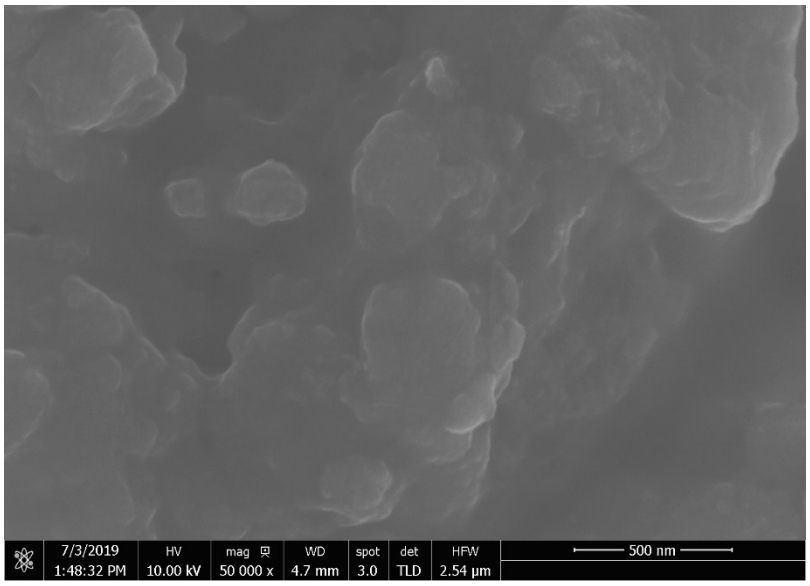


Figure S8 SEM image of PTCA-MoS_2-II after six months.