

Supporting Information

Facile colorimetric assay for trinitrotoluene based on the intrinsic peroxidase-like activity of MoS₂ nanosheets

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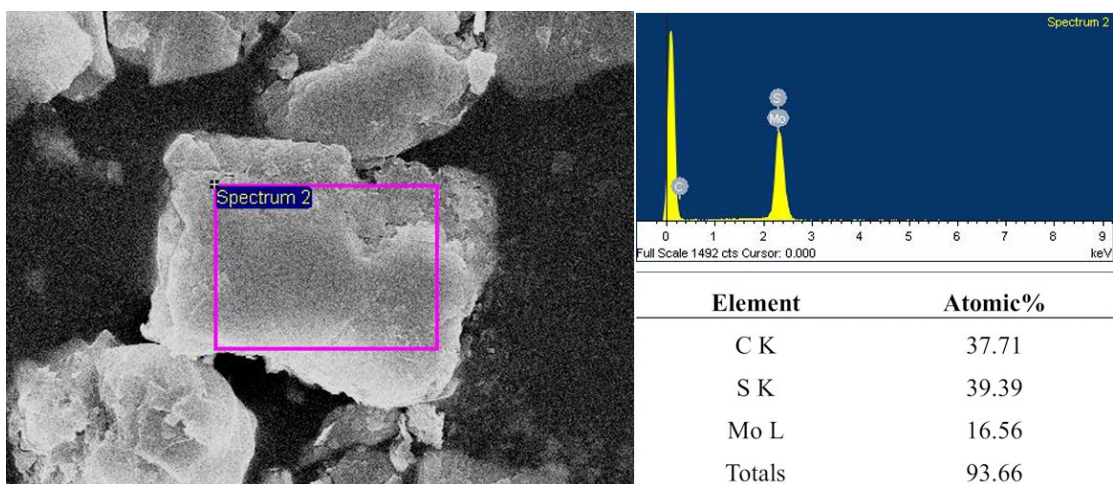


Figure S1 EDS analysis of Cys-MoS₂ NSs. The component and stoichiometry of Cys-MoS₂ NSs with the Mo/S atomic ratio of ~ 1:2, with the higher S content being ascribed to the presence of cysteine adsorbed on the surface of MoS₂ NSs.

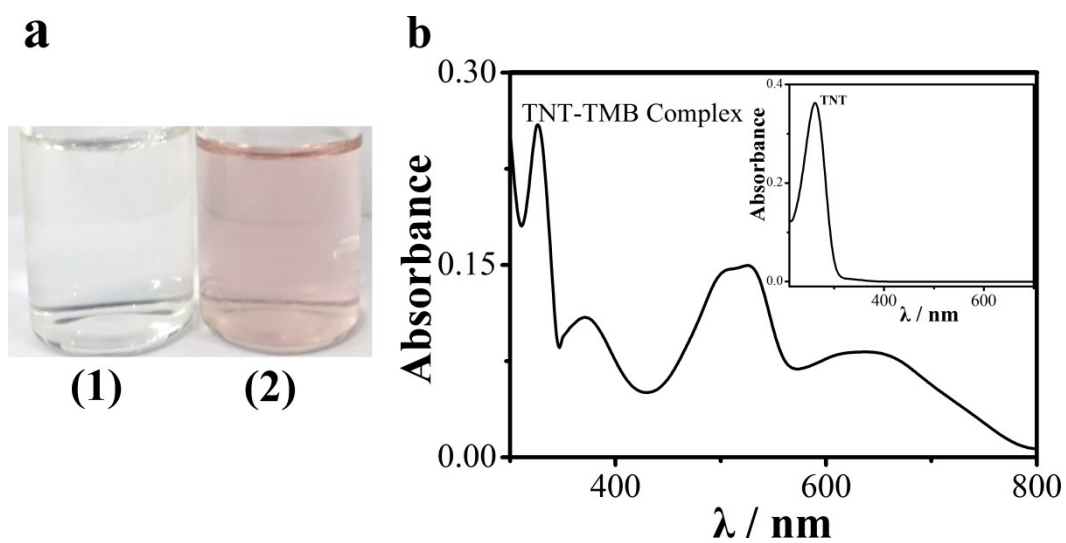


Figure S2 (a) Photograph showing how TNT changes the color when it forms Meisenheimer complex with TMB (8 mM TNT and 2.5 mM TMB): (1) 8 mM only TNT, (2) Meisenheimer complex after addition 2.5 mM in 8 mM TNT. (b) UV-vis absorption spectra demonstrating new peaks at 525 nm and 635 nm compared with TNT due to the formation of Meisenheimer complex between TNT and TMB. The inset of (b) is the UV-vis absorption spectrum of TNT.

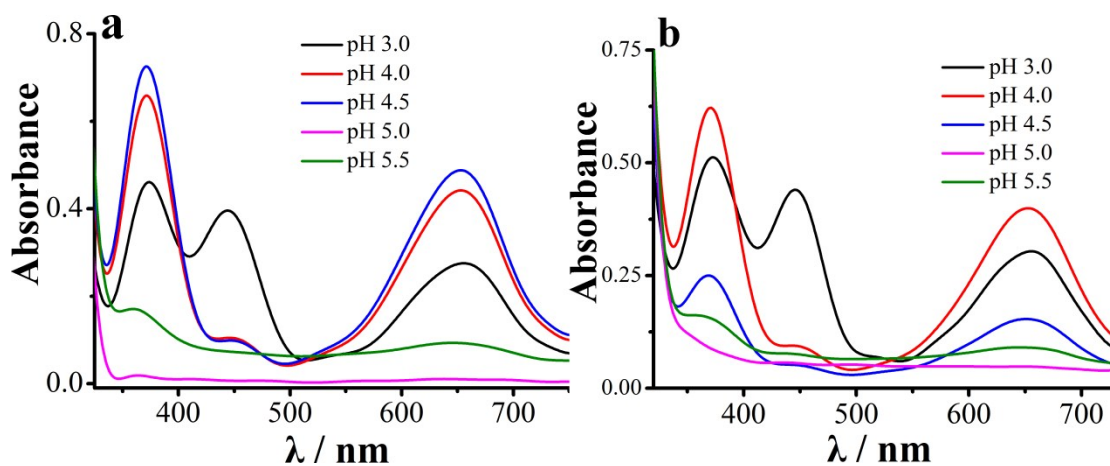


Figure S3 UV-vis absorption spectra of TMB reaction system in the absence (a) and presence of TNT (b) at different pH values (3.0, 4.0, 4.5, 5.0, 5.5).

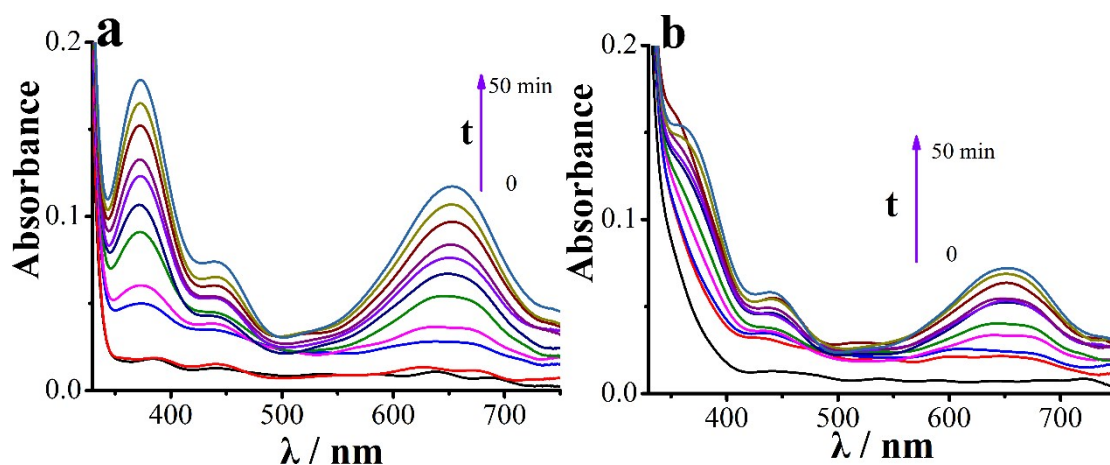


Figure S4 (a) Time-dependent absorbance changes at 652 nm of Cys-MoS₂ NSs + TMB + H₂O₂ systems. (b) Time-dependent absorbance changes at 652 nm of Cys-MoS₂ NSs + TMB + H₂O₂ + TNT systems. The concentration of TMB reaction systems: 10 $\mu\text{g}\cdot\text{mL}^{-1}$ Cys-MoS₂ NSs, 2.5 mM TMB, 4 mM H₂O₂ and 1 mM TNT, respectively.

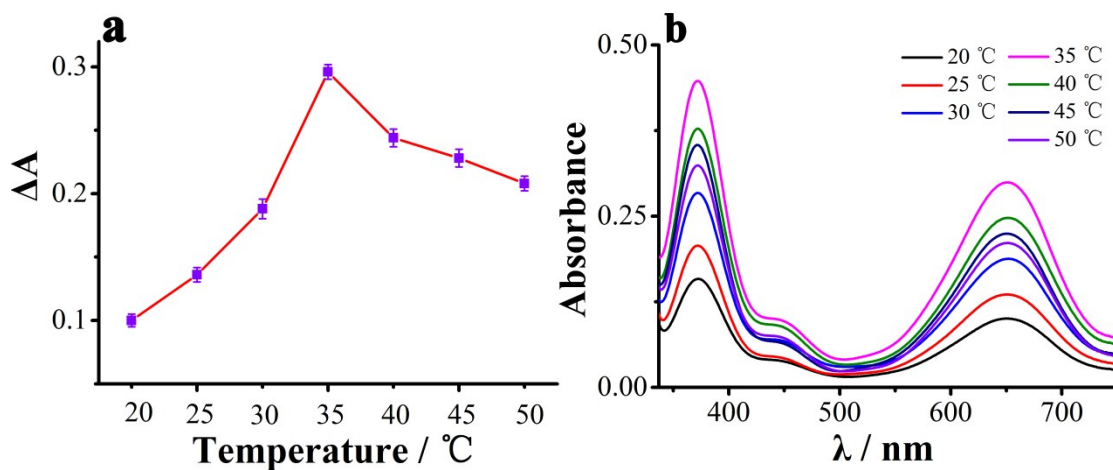


Figure S5 (a) The ΔA of TMB reaction systems and (b) UV-vis absorption spectra of TMB reaction systems in different temperatures.

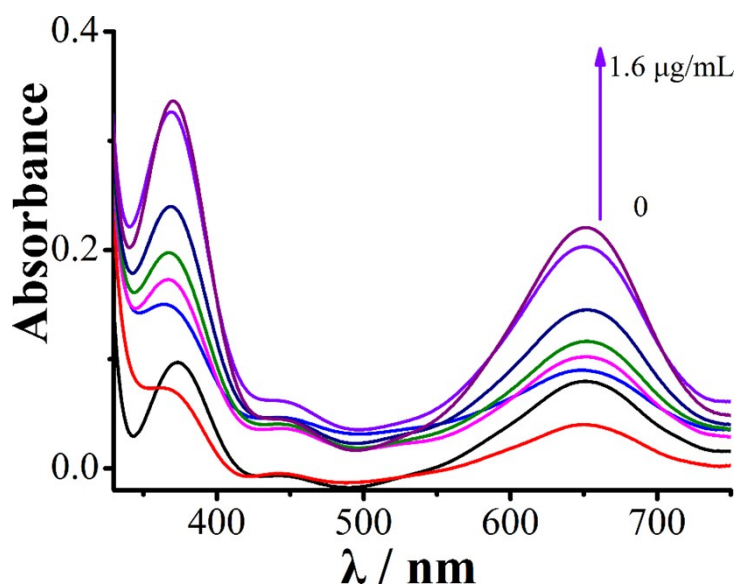


Figure S6 UV-vis absorption spectra of TMB reaction system with different concentrations of Cys-MoS₂ NSs (0, 0.05, 0.1, 0.2, 0.4, 0.5, 0.8, 1.6 $\mu\text{g}\cdot\text{mL}^{-1}$).

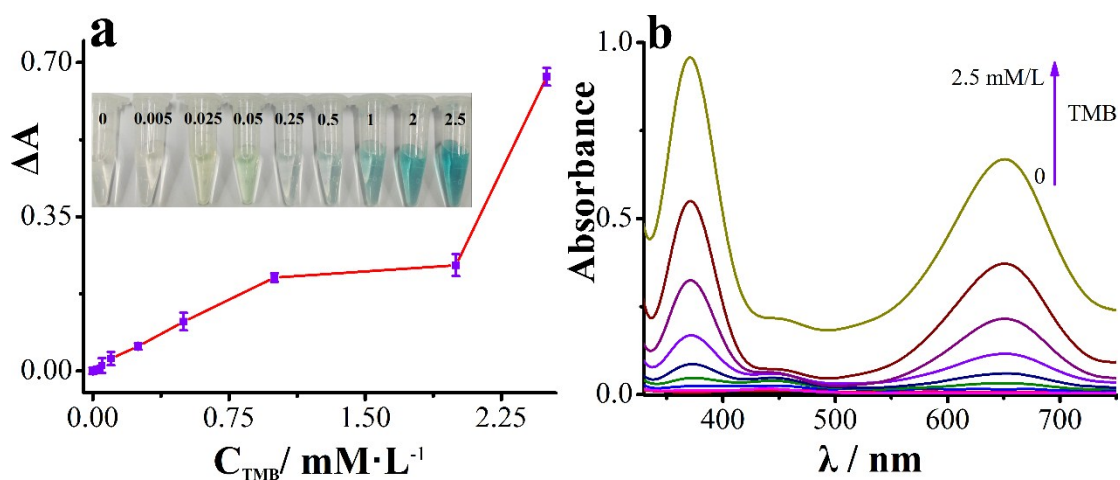


Figure S7 (a) The ΔA of TMB reaction systems and (b) UV-vis absorption spectra of TMB reaction systems with different concentration of TMB. The inset shows the photos of TMB reaction system.

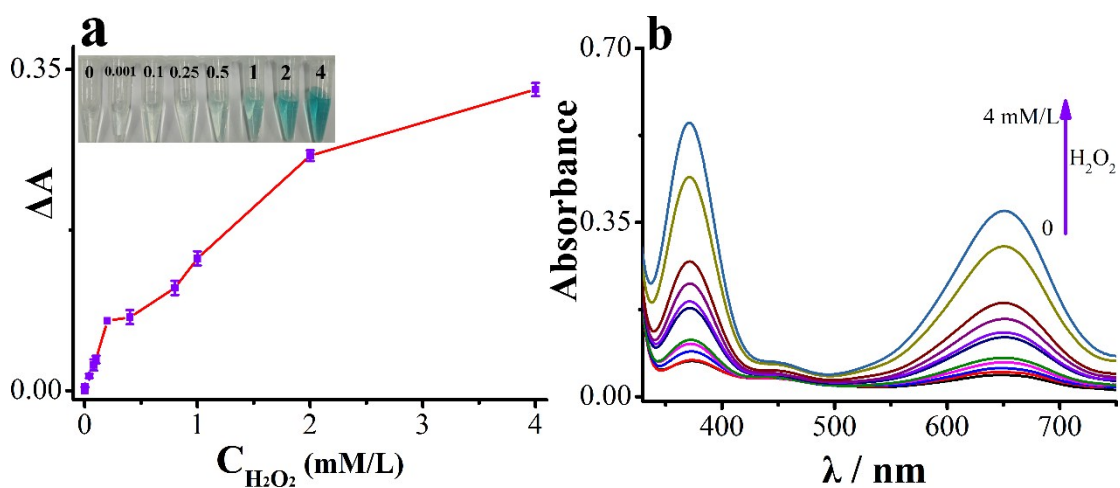


Figure S8 (a) The ΔA of TMB reaction systems change in different concentration of H_2O_2 (0, 0.001, 0.1, 0.2, 0.25, 0.5, 1, 2, 4 mM). The inset of (a) are images of colored products for different concentrations of H_2O_2 . (b) A concentrate-response curve for H_2O_2 .

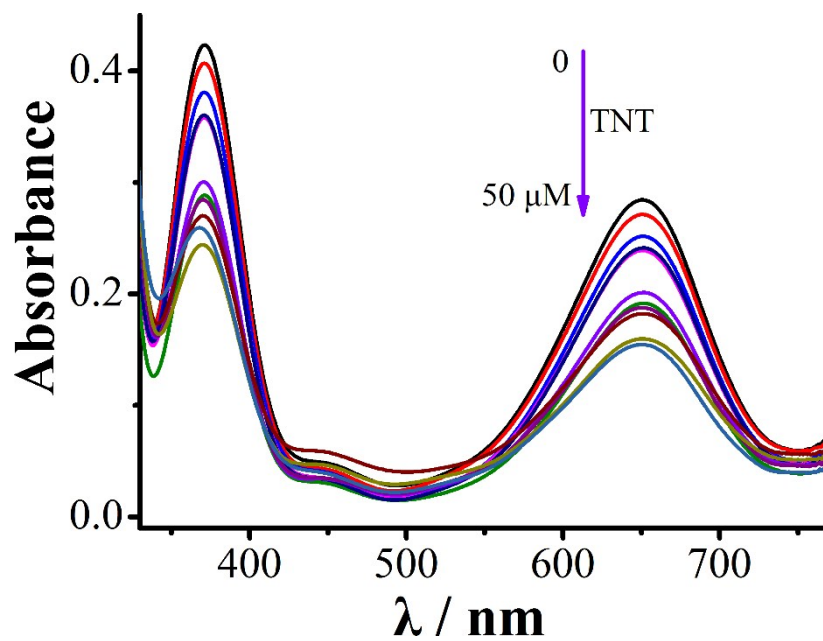


Figure S9 UV-vis absorption spectra of TMB reaction systems in the presence of TNT solution with different concentrations (0, 0.25, 0.5, 1, 1.25, 2.5, 5, 10, 25 and 50 μM).