Supplementary Information

A MnO_2 nanosheets-o-phenylenediamine oxidative system for the sensitive fluorescent determination of alkaline phosphatase activity

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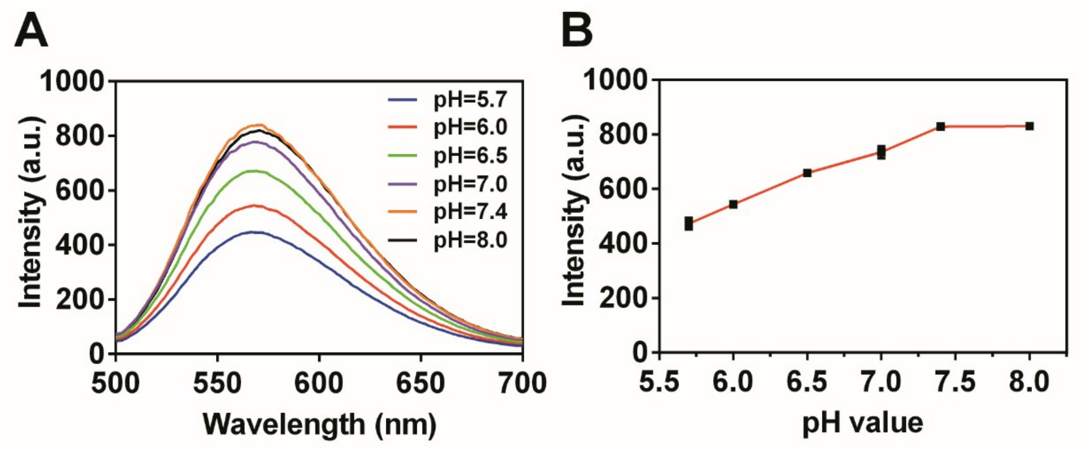

Fig. S1 Effects of buffer pH value for the MnO_2 nanosheets-OPDA system. Fluorescence emission spectra (A) and the curve for fluorescence intensity in response to pH (B). Concentrations: OPDA, 75 μM; MnO_2, 12.5 μg/mL.

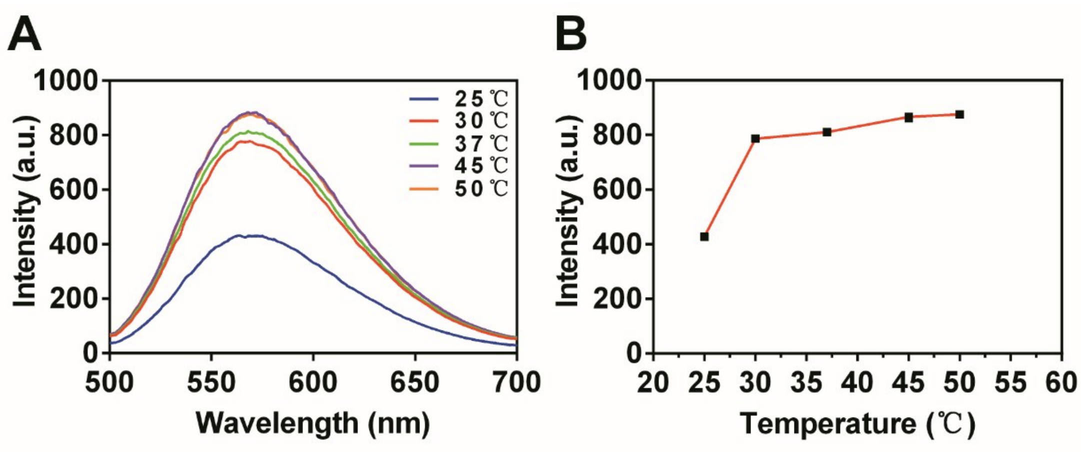

Fig. S2 Fluorescence change of the MnO_2 nanosheets-OPDA system toward different temperature. Fluorescence emission spectra (A) and the curve for fluorescence intensity in response to temperature (B). Concentrations: OPDA, 75 μM; MnO_2, 12.5 μg/mL.

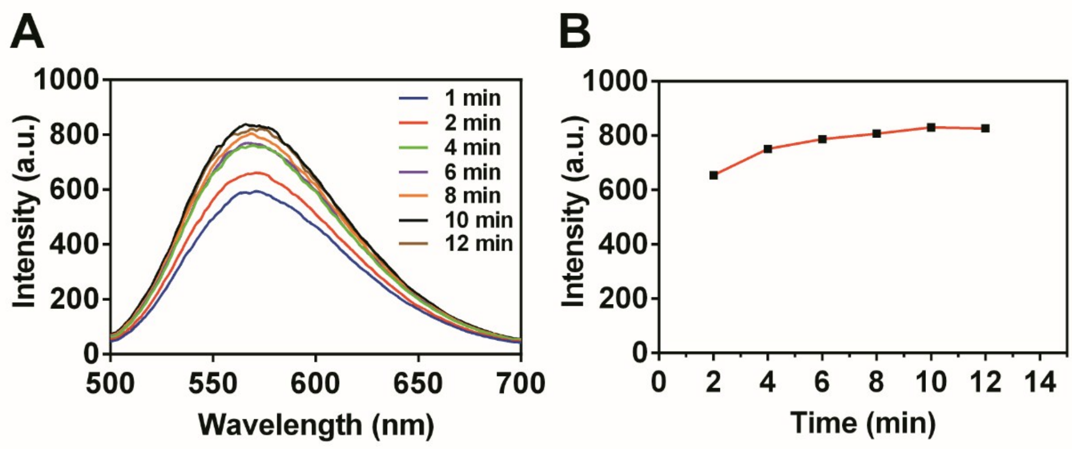

Fig. S3 Effects of reaction time on the MnO_2 nanosheets-OPDA system. Fluorescence emission spectra (A) and the curve for fluorescence intensity in response to reaction time (B). Concentrations: OPDA, 75 μM; MnO_2, 12.5 μg/mL.

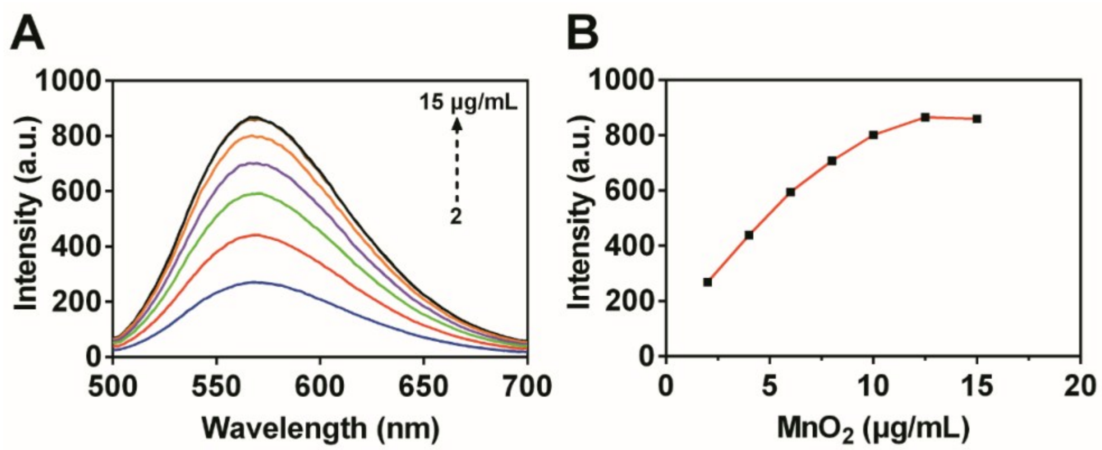

Fig. S4 Catalytic reactivity of the MnO_2 with different concentrations in the MnO_2 nanosheets-OPDA sensing system. Fluorescence emission spectra (A) and the curve for fluorescence intensity in response to MnO2 with various concentrations (B). Concentrations: OPDA, 75 μM; MnO_2, 2, 4, 6, 8, 10, 12.5, 15 μg/mL.

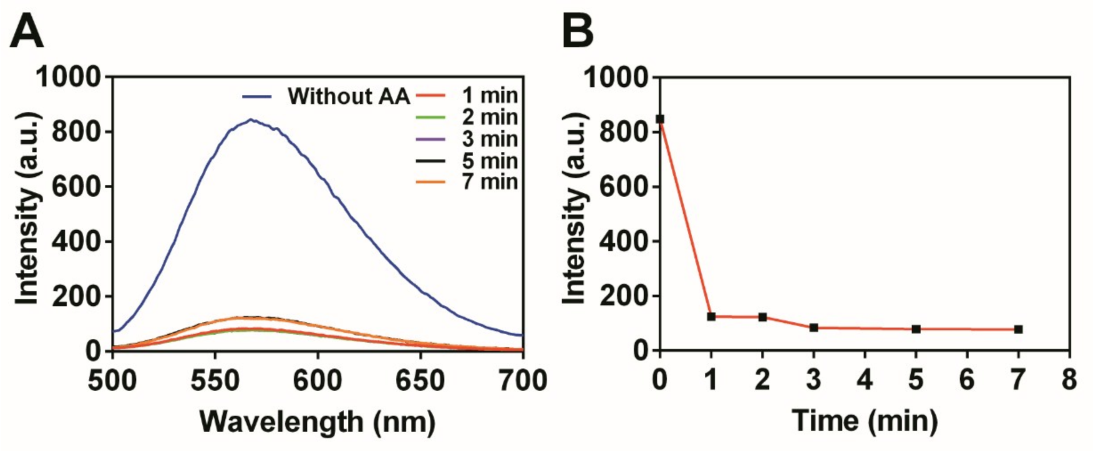

Fig. S5 Effects of incubation time between MnO_2 nanosheets and AA on the fluorescence emission spectra of MnO_2 nanosheets-OPDA system (A) and the corresponding curve for fluorescence change (B). Concentrations: OPDA, 75 µM; MnO_2, 12.5 µg/mL; AA, 400 U/L.

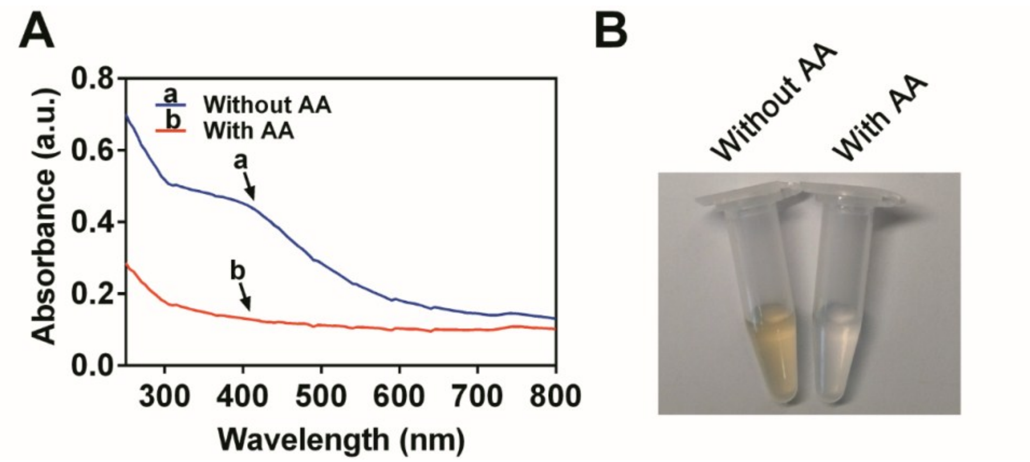

Fig. S6 The UV-vis absorption spectra (A) and corresponding photographs (B) of MnO_2 nanosheets solution before and after AA treatment. Concentrations: MnO_2, 12.5 µg/mL; AA, 50 µM.

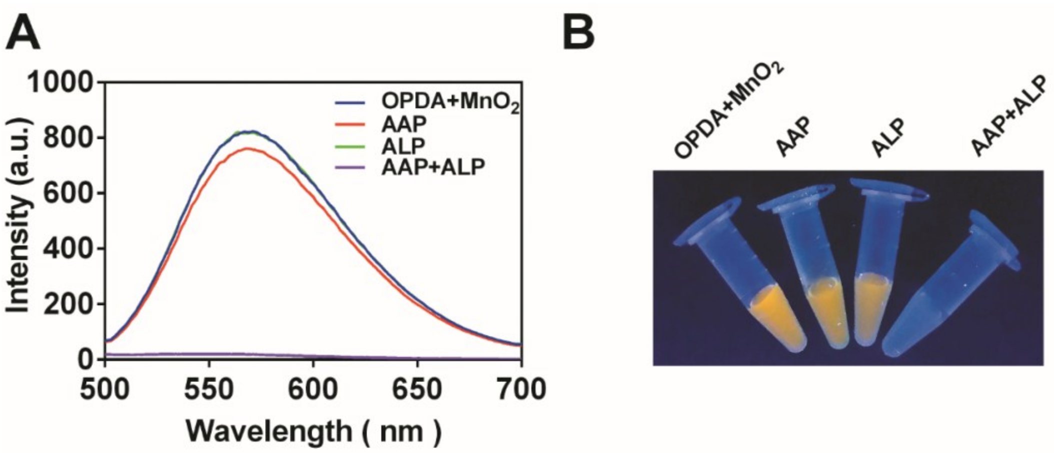

Fig. S7 The effect of AAP or ALP alone, AAP and ALP on fluorescence emission spectra (A) of MnO_2 nanosheets-OPDA sensing system and corresponding photographs (B). Concentrations: OPDA, 75 μM; MnO_2, 12.5 μg/mL; AAP, 5 mM; ALP, 600 U/L.

Table S1. Comparison of ALP assay in analytical performance.

Materials	Detection method	Linear range (U/L)	Detection limit (U/L)	Reference
DNA-Cu(II) complexes	Colorimetric method	20-200	0.84	S1
Cu^{2+}-modulated G-Quadruplex-based DNAzymes	Colorimetric method	0.07–100	0.07	S2
CdSe quantum dots	Electrochemiluminescence	2–25	2	S3
p-nitrophenyl phosphate	Electrochemistry	0.4-2000	0.3	S4
CuS/GR	Electrochemistry	0.1-100	0.02	S5
p-nitrophenyl phosphate	Electrochemistry	5-250	0.5	S6
Polymer nanoparticles	Fluorescence	25–200	10	S7
Carbon dots	Fluorescence	0.01–25	0.001	S8
CDs–MnO_2	Fluorescence	1-100	0.4	S9
F-PDA–MnO_2	Fluorescence	1-80	0.34	S10
MnO_2 nanosheets-OPDA	Fluorescence	0.1-200	0.1	This work

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