Electronic Supplementary Material (ESI) for Analytical Methods.

Supporting Information

Colorimetric detection of phosphate based on the inhibition of peroxidase-like activity of magnetite nanoparticles

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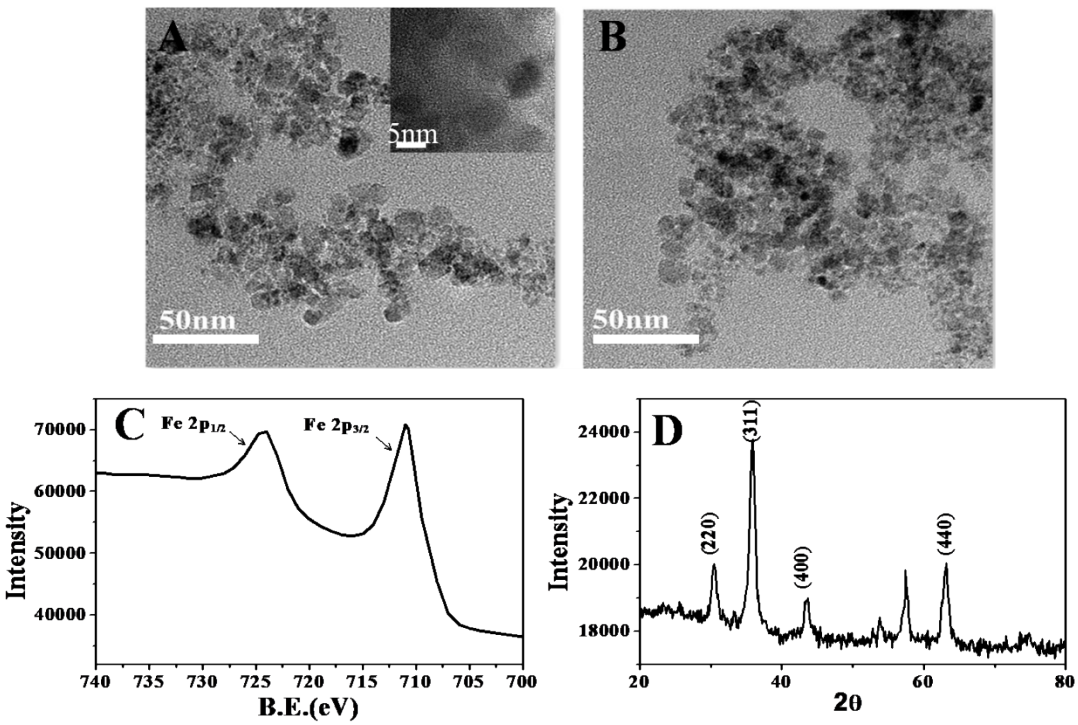

Fig.S1 HRTEM images of the Fe_3O_4 MNPs (A) and Fe_3O_4 MNPs + Pi(B). The XPS spectrum of Fe 2p from the fractured surface of the Fe_3O_4 MNPs(C), XRD patterns of Fe_3O_4 MNPs(D).

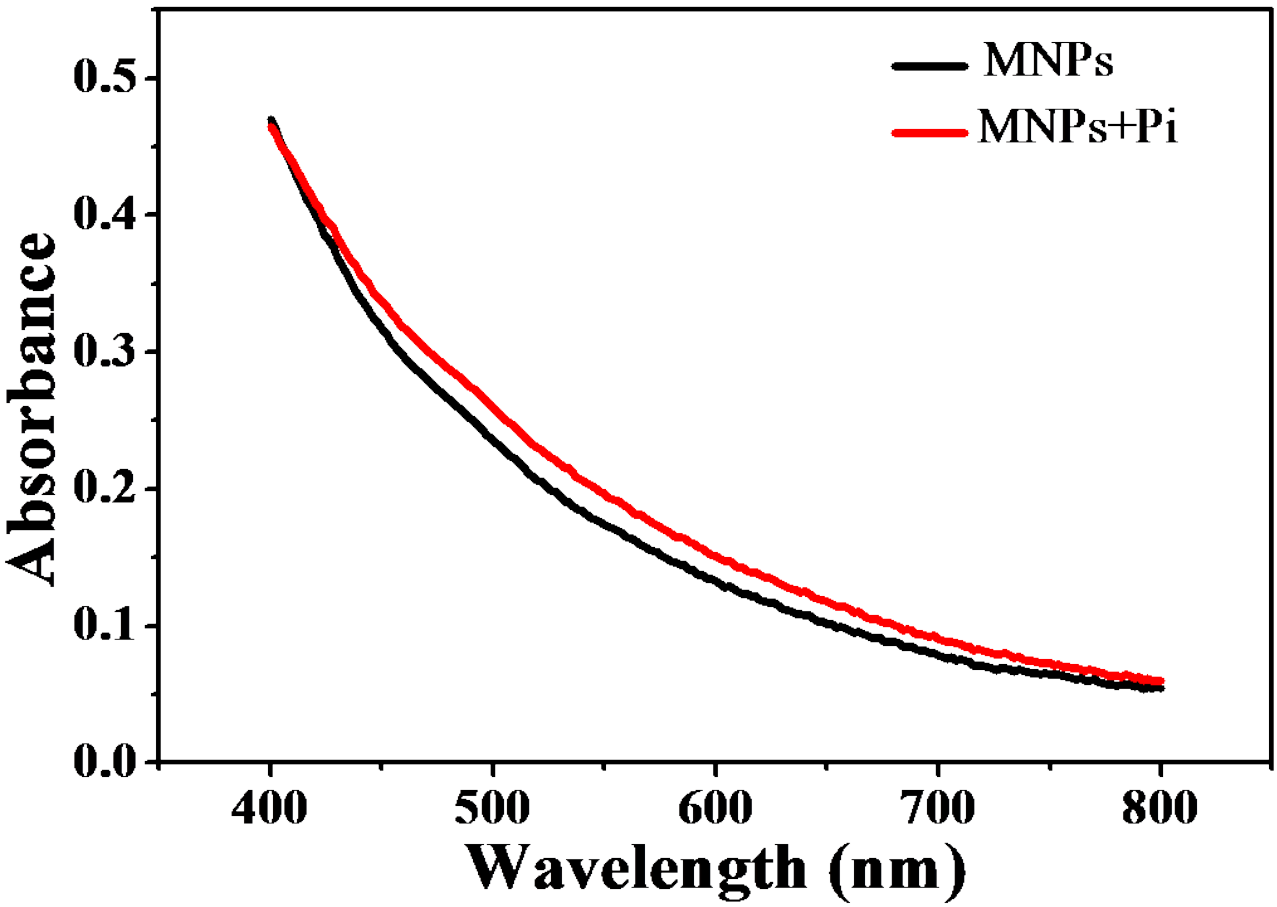

Fig.S2 UV–vis absorption spectra of the Fe_3O_4 MNPs in HAc-NaAc buffer solution. MNPs: 27.5 μg/mL, Pi: 100 μM, HAc-NaAc buffer solution (0.2 M, pH 3.6); and 5 min at room temperature for the coordination reaction.

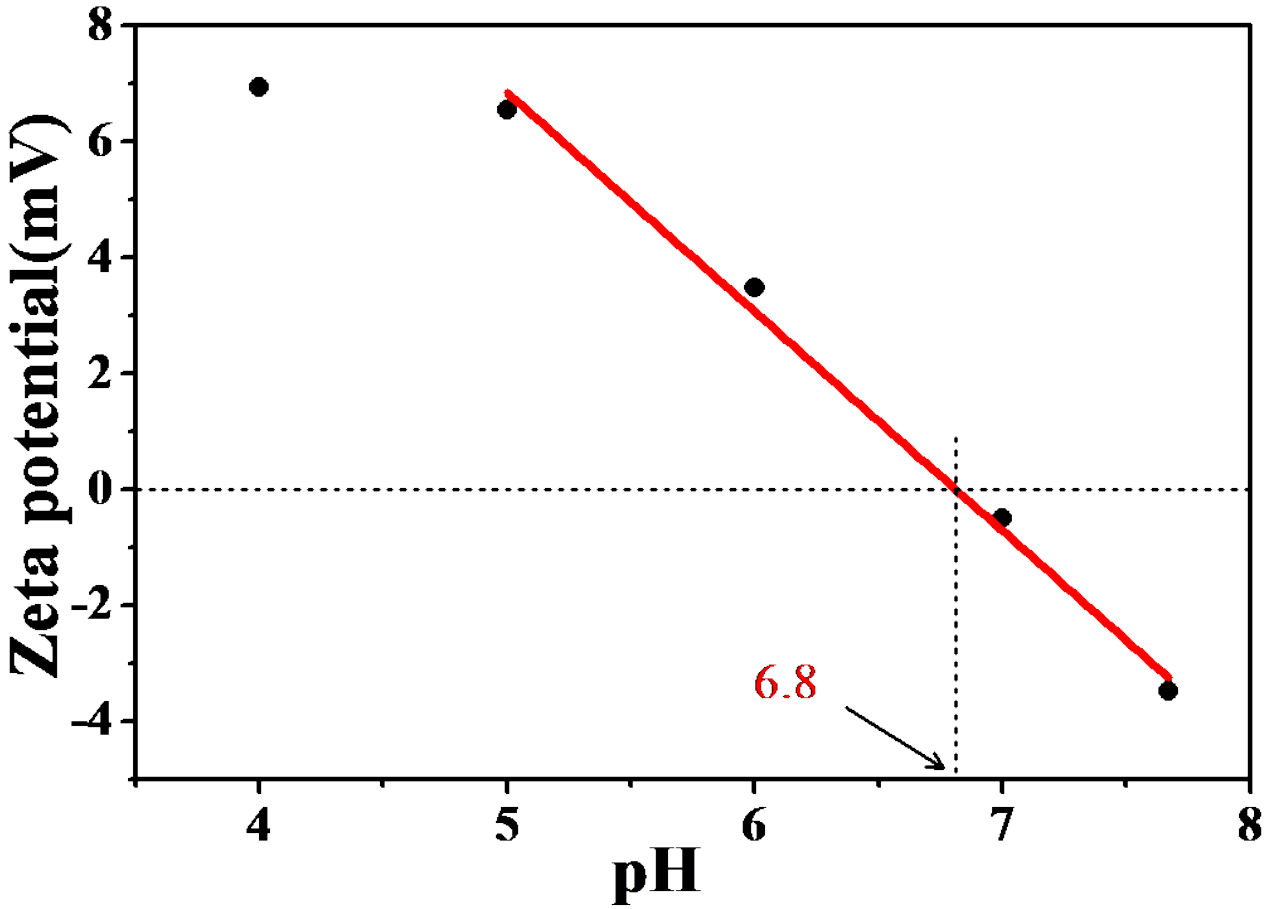

Fig.S3 Zeta potential versus pH of Fe_3O_4 MNPs at 25 ℃. MNPs: 27.5 μg/mL, , HAc-NaAc buffer solution (0.2 M, pH 4.0, 5.0, 6.0, 7.0,7.7) The pI of Fe_3O_4 MNPs is 6.8

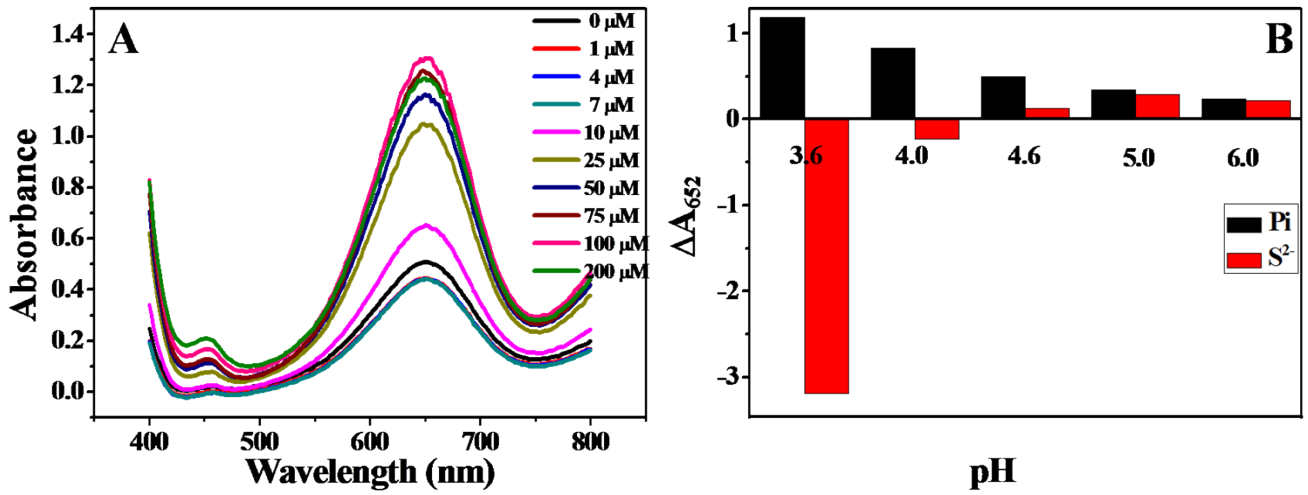

Fig.S4 (A) UV–vis absorption spectra of the Fe_3O_4 MNPs-TMB-H_2O_2 system containing various concentrations of S^{2-} at pH 3.6. The solution was diluted for 4 times before detection (B) The ΔA_{652} response of the assay systems toward phosphate and S^{2-} under various pH values. MNPs: 27.5 μg/mL, TMB: 2.5 mM, H_2O_2: 4.0 mM, HAc-NaAc buffer solution (0.2 M, pH 3.6, 4.0, 4.6, 5.0, 6.0).

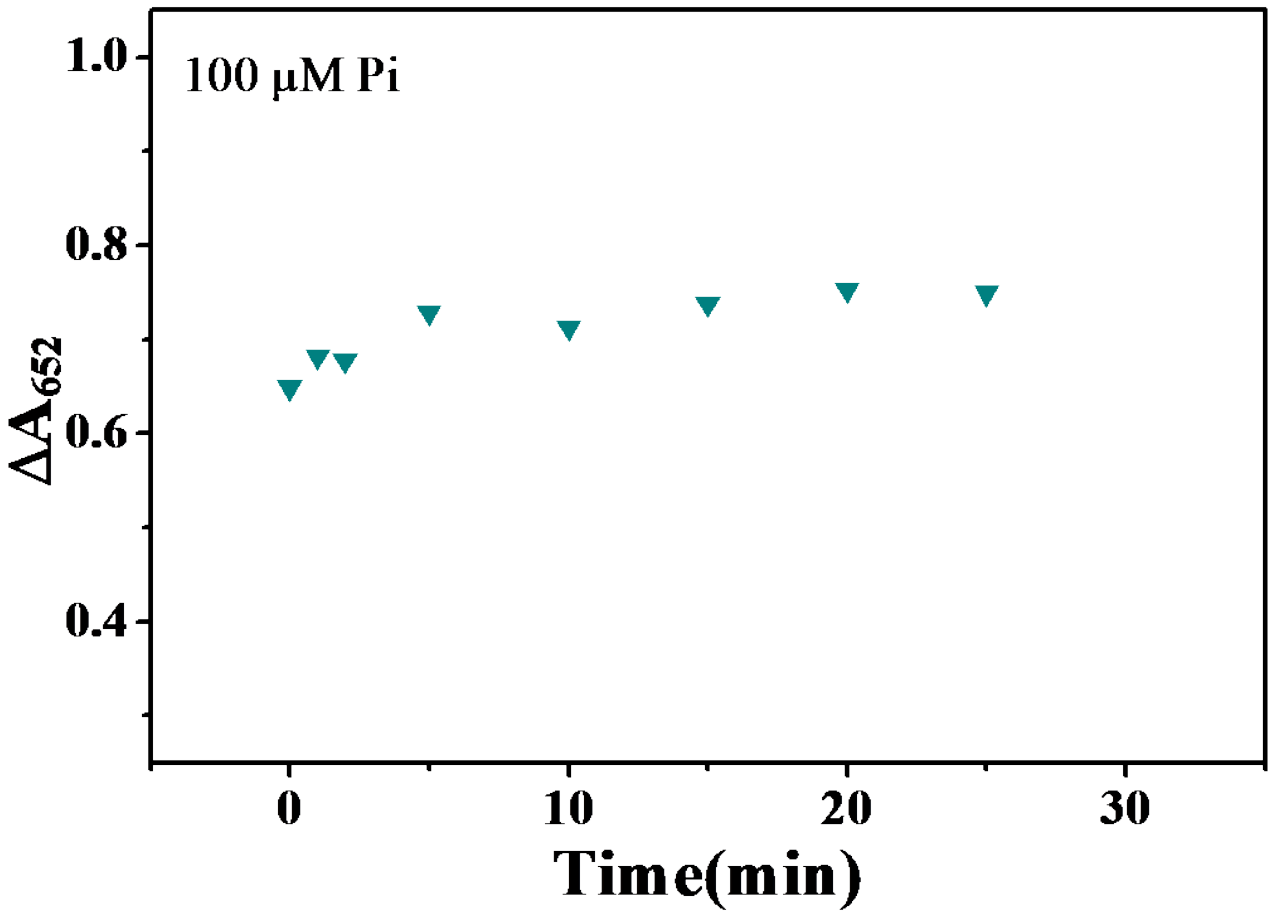

Fig.S5 Plot of ΔA_{652} versus time of coordination reaction at ambient temperature. MNPs: 27.5 μg/mL, TMB: 2.5 mM, H_2O_2: 4.0 mM, Pi: 100 μM, HAc-NaAc buffer solution (0.2 M, pH 4.0).

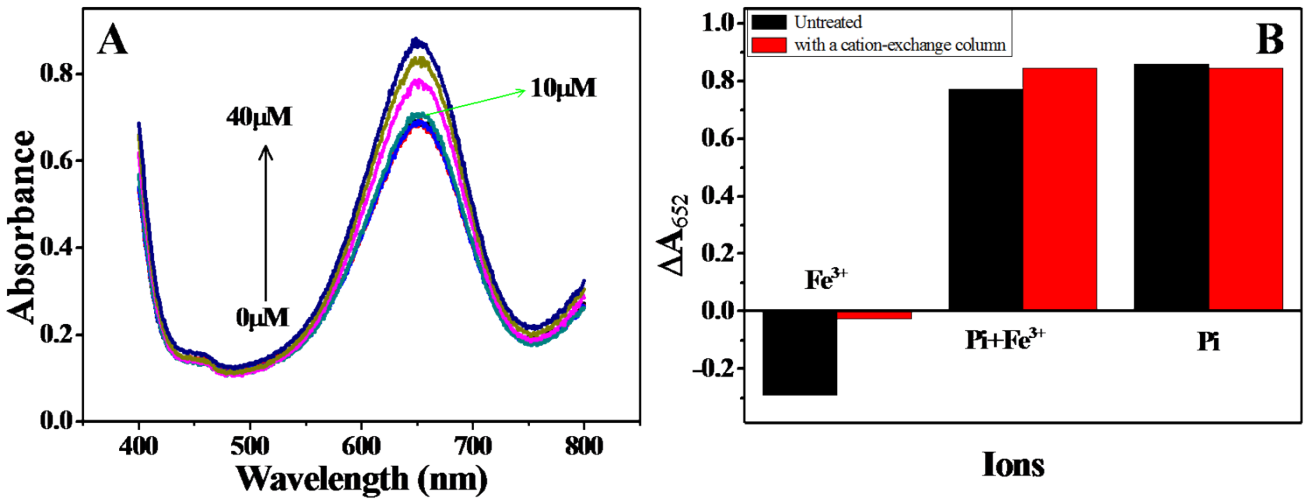

Fig.S6 (A) UV–vis absorption spectra of the Fe_3O_4 MNPs-TMB-H_2O_2-Pi system containing various concentrations of Fe^{3+}. (B) The ΔA_{652} response of the assay systems toward Fe^{3+}, Pi+Fe^{3+} and Pi before and after pretreatment by a cation-exchange column. MNPs: 27.5 μg/mL, TMB: 2.5 mM, H_2O_2:4.0 mM, HAc-NaAc buffer solution (0.2 M, pH 4.0), Fe^{3+}: 10μM.

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