Electronic Supplementary Information

Evaluation of antioxidant activity of phenols and tannic acid determination with

Mn₃O₄ nano-octahedrons as oxidase mimic

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Figure captions

Fig. S1 EDX spectrum of the synthesized sample (inset was the TEM image).

Fig. S2 FT-IR spectrum of the Mn₃O₄ NPs.

Fig. S3 The effect of free radical scavenger on the TMB- Mn_3O_4 NPs system. Conditions: 10⁻⁴ M TMB, 5 mg/L Mn_3O_4 NPs, 35 °C, pH 3.5 (0.2 M acetate buffer).

Fig. S4 (A) Effect of pH. Conditions: 10^{-4} M TMB, 5 mg/L Mn₃O₄ NPs, 30 °C, incubation for 30 min. (B) Effect of temperature. Conditions: 10^{-4} M TMB, 5 mg/L Mn₃O₄ NPs, pH 3.5 (0.2 M acetate buffer), incubation for 30 min. (C) Effect of Mn₃O₄ NPs. 10^{-4} M TMB, pH 3.5 (0.2 M acetate buffer), 35 °C, incubation for 30 min.

Fig. S5 The stability of Mn_3O_4 NPs with TMB oxidation. (A) Mn_3O_4 NPs were first incubated at pH from 1.0 to 12.0 for 2 h and then the oxidase mimic activity was measured under standard conditions. (B) Mn_3O_4 NPs were first incubated at 20-80 °C for 2 h and then the oxidase mimic activity was measured under standard conditions.

Fig. S6 Variation of catalytic activity of the Mn₃O₄ NPs with time.

Fig. S7 (A) Effect of pH on the TMB-Mn₃O₄ NPs-TA system. Conditions: 10^{-4} M TMB, 5 mg/L Mn₃O₄ NPs, 10^{-6} M TA, 30 °C, incubation for 30 min. (B) Effect of temperature on the TMB-Mn₃O₄ NPs-TA system. Conditions: 10^{-4} M TMB, 5 mg/L Mn₃O₄ NPs, 10^{-6} M TA, pH 4.0 (0.2 M acetate buffer), incubation for 30 min. (C) Effect of the amount of Mn₃O₄ NPs on the TMB-Mn₃O₄ NPs-TA system. 10^{-4} M TMB, 10^{-6} M TA, pH 4.0 (0.2 M acetate buffer), 35° C, incubation for 30 min.



Fig. S1



Fig. S2



Fig. S3



Fig. S4





Fig. S6



Fig. S7

Batch No.	1	2	3	RSD (%)
Catalytic activity (%)	100±1.3ª	94.1±3.8ª	96.0±2.2ª	3.1

^a RSD for three duplicate determinations.

	Added	Total found ^a	Recovery
Sample	(µM)	(µM)	(%)
Green tea	0	0.41±0.03	-
	0.4	0.88±0.03	108.7
	0.8	1.13±0.02	93.4
	1.0	1.34±0.01	95.1
Red tea	0	0.13±0.01	-
	0.2	0.34±0.01	102.4
	0.4	0.57±0.05	107.8
	0.6	0.73±0.03	100.0
Maojian tea	0	0.34±0.02	-
	0.3	0.69 ± 0.03	107.4
	0.6	$0.97 {\pm} 0.01$	103.3
	0.9	$1.24{\pm}0.01$	99.8

Table S2 The results of the determination of tannic acid in the tea samples

^a Average \pm standard deviation (n = 3).