Electronic Supplementary Material (ESI) for New Journal of Chemistry.

The peroxidase-like catalytic activity of ferrocene and its application in the biomimetic synthesis of microsphere polyaniline

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Supporting Information (SI) 1:

Feasibility:

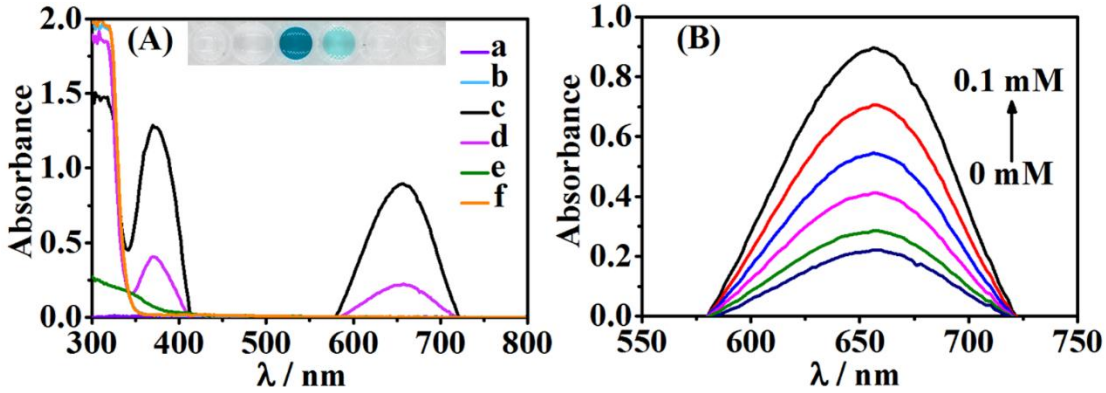

Fig.S1 (A) Absorption spectra in the presence of (a) 0.1 mM Fc, (b) 1.0 mM TMB, (c) 0.1 mM Fc + 1.0 mM TMB + 10 mM H_2O_2, (d) 1.0 mM TMB + 10 mM H_2O_2, (e) 0.1 mM Fc + 10 mM H_2O_2, or (f) 0.1 mM Fc + 1.0 mM TMB. Experiments were carried out in 0.2 M HAc/NaAc (pH 4.0). The incubation time was 30 min. The reaction solution color of (a), (b), (c), (d), (e) and (f) were photographed and sorted from left to right. (B) Absorption spectra of the resulting solutions in the presence different concentrations of Fc. Experiments were carried out in 0.2 M HAc/NaAc (pH 4.0) in the presence of 1.0 mM TMB and 10 mM H_2O_2, its incubation time was 30 min.

Supporting Information (SI) 2:

The optimal conditions of the experimental of peroxidase-like catalytic activity of Fc:

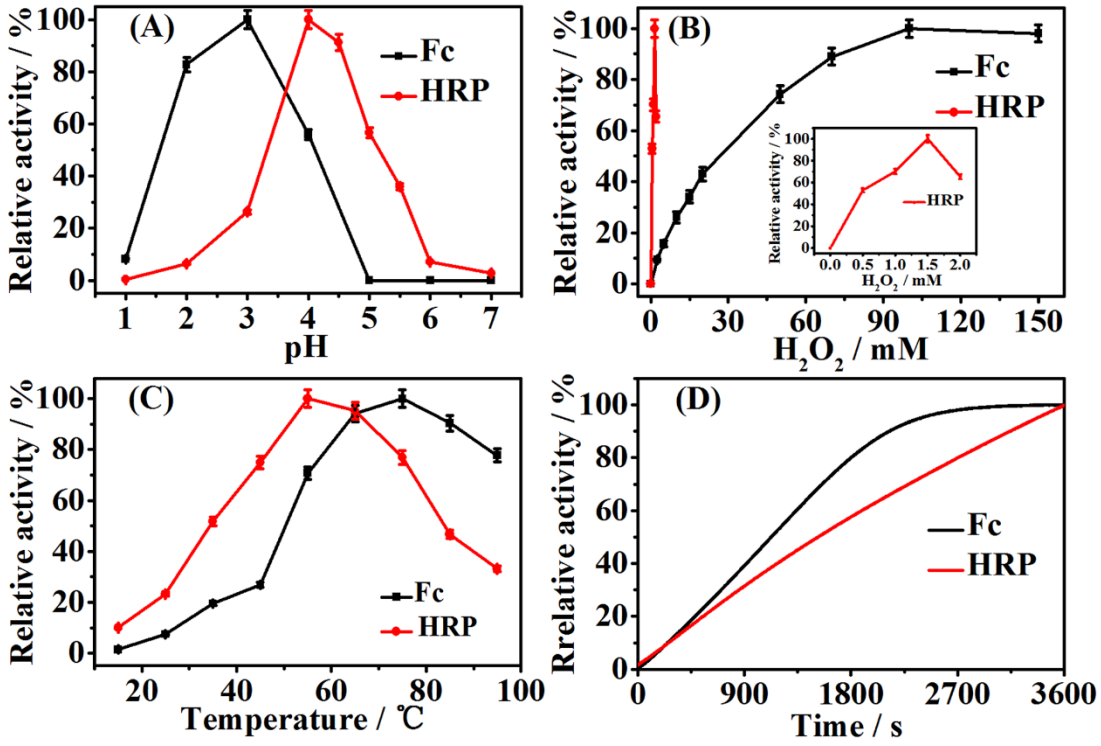

Fig.S2 Effects of pH (A), H_2O_2 concentration (B), reaction temperature (C) and dynamics (D) on the catalytic activity of Fc and HRP. The final concentration of Fc, HRP and TMB were 0.1 mM, 5 pg/mL and 1.0 mM, respectively. All experiments were carried out in 0.2 M HAc/NaAc buffer solution. For (A), the reaction temperature and reaction time is 25 ^{o}C and 30 min, the concentration of H_2O_2 is 10 mM; for (B), 25 ^{o}C, 30 min, pH 3 (Fc), pH 4 (HRP); for (C), 25 ^{o}C, 30 min, pH 3 (Fc), pH 4 (HRP), 100 mM H_2O_2 (Fc), 1.5 mM H_2O_2 (HRP); for (D), 75 ^{o}C (Fc), 50 ^{o}C (HRP), 30 min, pH 3 (Fc), pH 4 (HRP), 100 mM H_2O_2 (Fc), 10 mM H_2O_2 (HRP). The maximum point in each curve is set as 100% and the relative activity for others is calculated accordingly. Error bars represent the standard deviations of three repeated measurements.

Supporting Information (SI) 3:

Investigation of the effective free radicals in the reaction system:

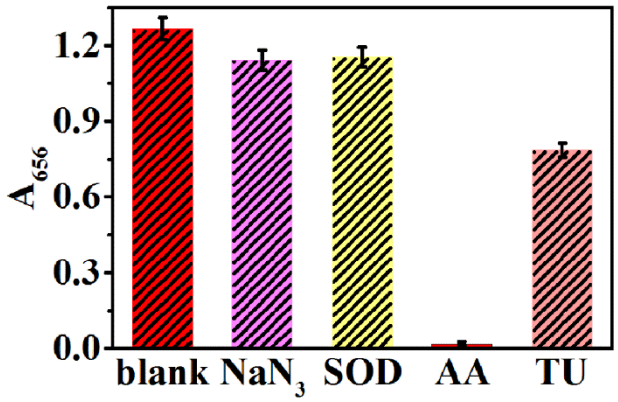

Fig.S3 A_{656} in the presence of NaN_3 (1.0 mM), SOD (30 U/mL), AA (1.0 mM), TU (1.0 mM), or the blank control. The final concentration of Fc, TMB and H_2O_2 were 0.1 mM, 1.0 mM, and 100 mM, respectively. Experiments were carried out in 0.2 M HAc/NaAc (pH 3) buffer solution. Error bars represent the standard deviations of three repeated measurements.

Supporting Information (SI) 4:

XRD patterns:

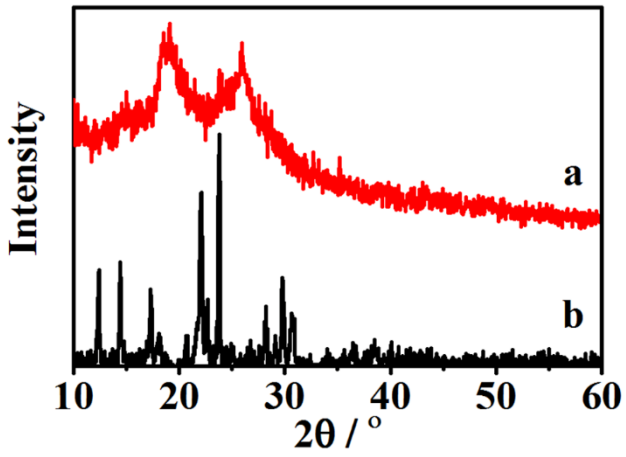

Fig.S4 XRD patterns of PANI synthesized in the presence (a) or absence (b) of Fc.

Supporting Information (SI) 5:

FT-IR spectra:

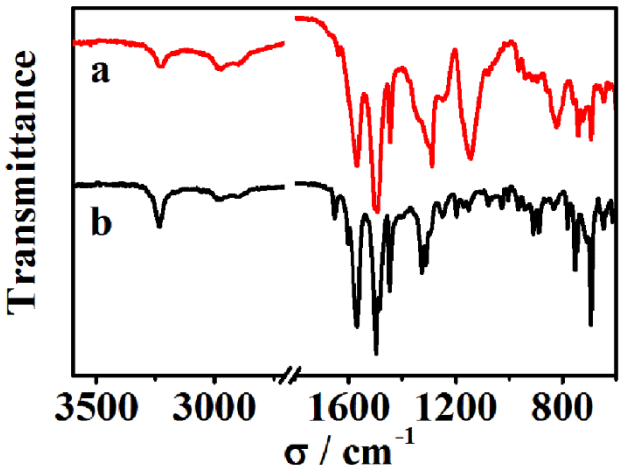

Fig.S5 FT-IR spectra of PANI synthesized in the presence (a) or absence (b) of Fc.

Supporting Information (SI) 6:

Absorption spectra:

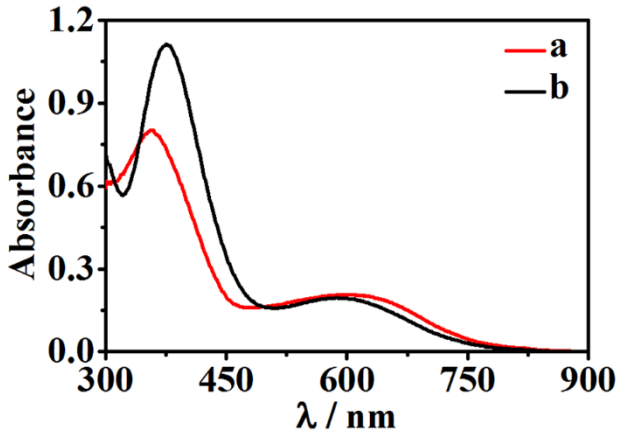

Fig.S6 Absorption spectra of PANI synthesized in the presence (a) or absence (b) of Fc.

Supporting Information (SI) 7:

Cyclic voltammogram:

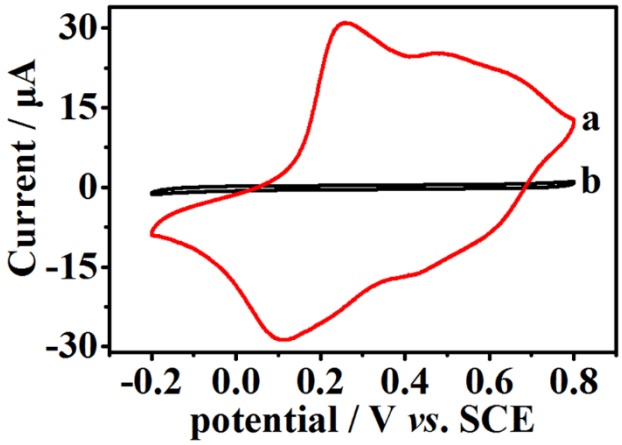

Fig.S7 Cyclic voltammogram of (b) the bare GCE or (a) in the presence of a PANI film.