Supporting information for

Parallel Comparative Studies on Composition-dependent Peroxidase-like Catalytic Activity of Ultrasmall Ferrite Nanoparticles

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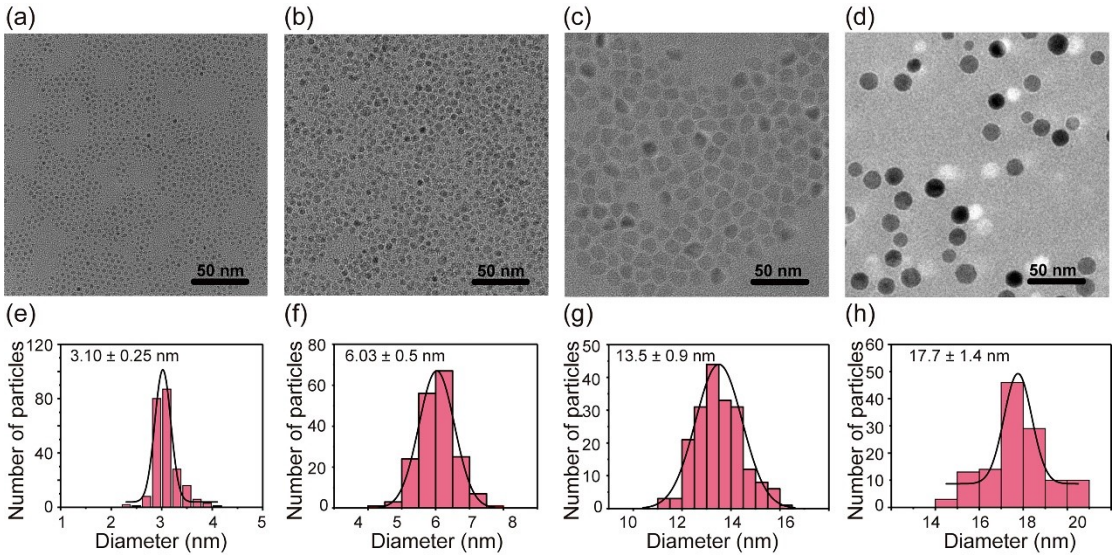

Figure S1. TEM images and the particle size distribution histograms of **(a) (e)** 3 nm, **(b) (f)** 6 nm, **(c) (g)** 14 nm and **(d) (h)** 18 nm sized $CoFe_2O_4$ nanoparticles.

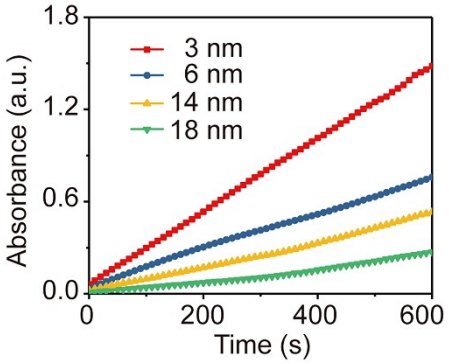

Figure S2. Time-dependent UV-vis absorbance changes at 652 nm of the TMB-H_2O_2 reaction system catalyzed by 3 nm, 6 nm, 14 nm, and 18 nm sized ferrite nanoparticles.

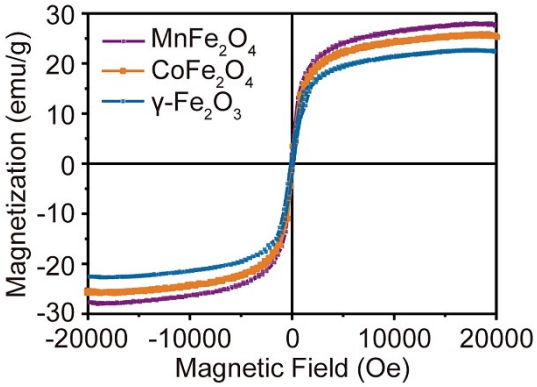

Figure S3. Hysteresis loop of the $CoFe_2O_4$, $MnFe_2O_4$, and γ-Fe_2O_3 nanoparticles at room temperature.

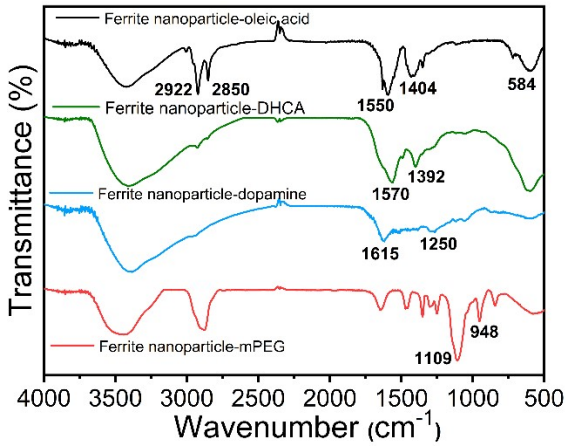

Figure S4. Fourier transform infrared spectroscopy (FTIR) for the ferrite nanoparticles before and after surface modification using dopamine, DHCA, and PO-mPEG ligands.

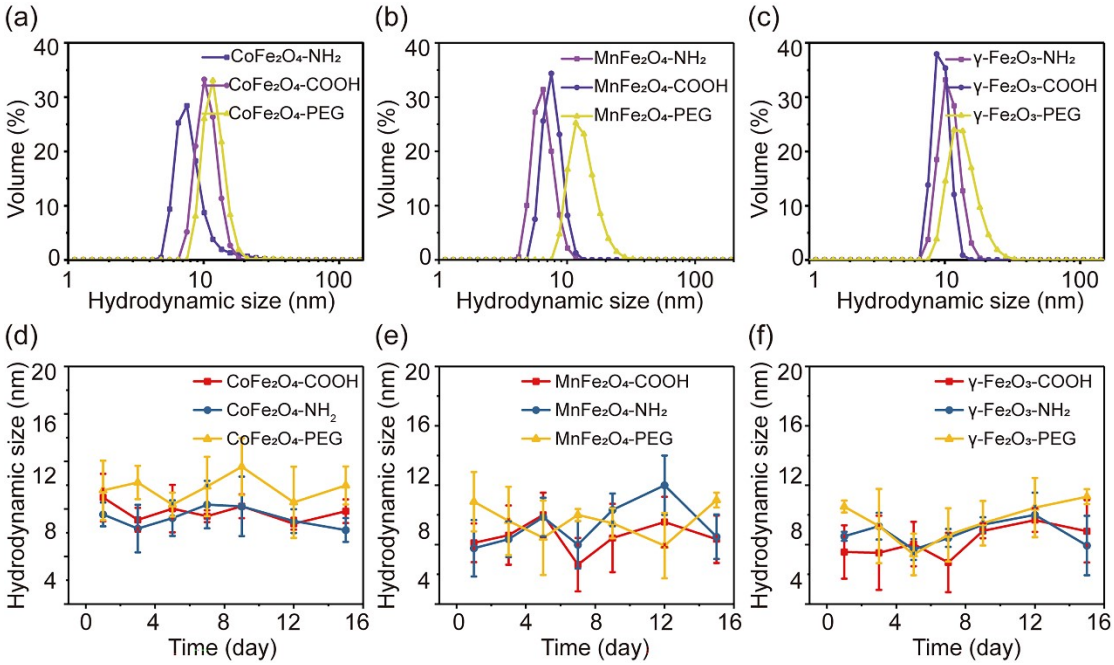

Figure S5. Hydrodynamic diameters of the dopamine, DHCA and PO-mPEG modified **(a)** $CoFe_2O_4$, **(b)** $MnFe_2O_4$ and **(c)** γ-Fe_2O_3 nanoparticles. Hydrodynamic size variation of the dopamine, DHCA and PO-mPEG modified **(d)** $CoFe_2O_4$, **(e)** $MnFe_2O_4$ and **(f)** γ-Fe_2O_3 nanoparticles as a function of time upon incubation in water.

Table S1 Zeta potential of ultrasmall $CoFe_2O_4$, $MnFe_2O_4$ and γ-Fe_2O_3 nanoparticles with the surface modification of dopamine, DHCA and PO-mPEG.

	$CoFe_2O_4$	**$MnFe_2O_4$**	**γ-Fe_2O_3**
Dopamine	30.6	30.4	29.0
DHCA	-28.0	-33.7	-34.7
PO-mPEG	5.4	11.4	6.6

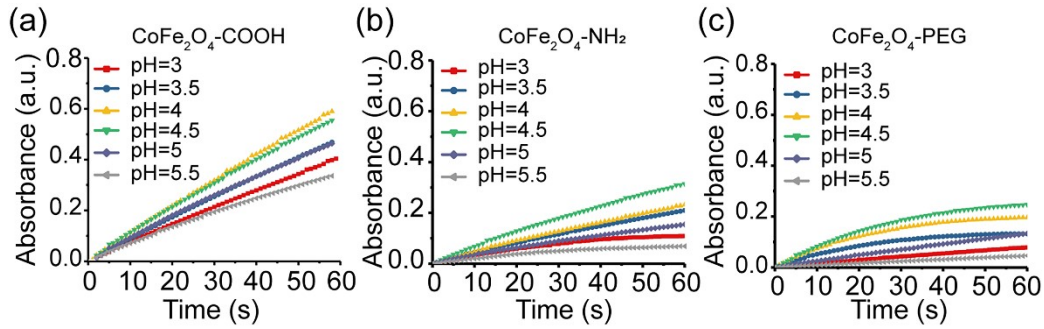

Figure S6. Time-dependent UV-vis absorbance changes at 652 nm of the TMB-H_2O_2 reaction system catalyzed by **(a)** DHCA **(b)** dopamine and **(c)** PO-mPEG modified $CoFe_2O_4$ nanoparticles at the pH range from 3 to 5.5.

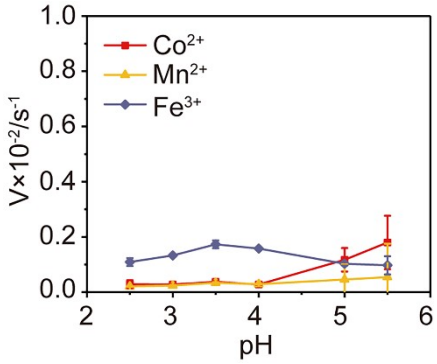

Figure S7. Peroxidase activity of dissociative Co^{2+}, Mn^{2+} and Fe^{3+} were measured under standard conditions at a range of pH values from 2.5 to 5.5.