

Supporting Information

Designing Ultrafine PdCo Alloys in Mesoporous Silica Nanospheres with Peroxidase-like Activity and Catalase-like Activity

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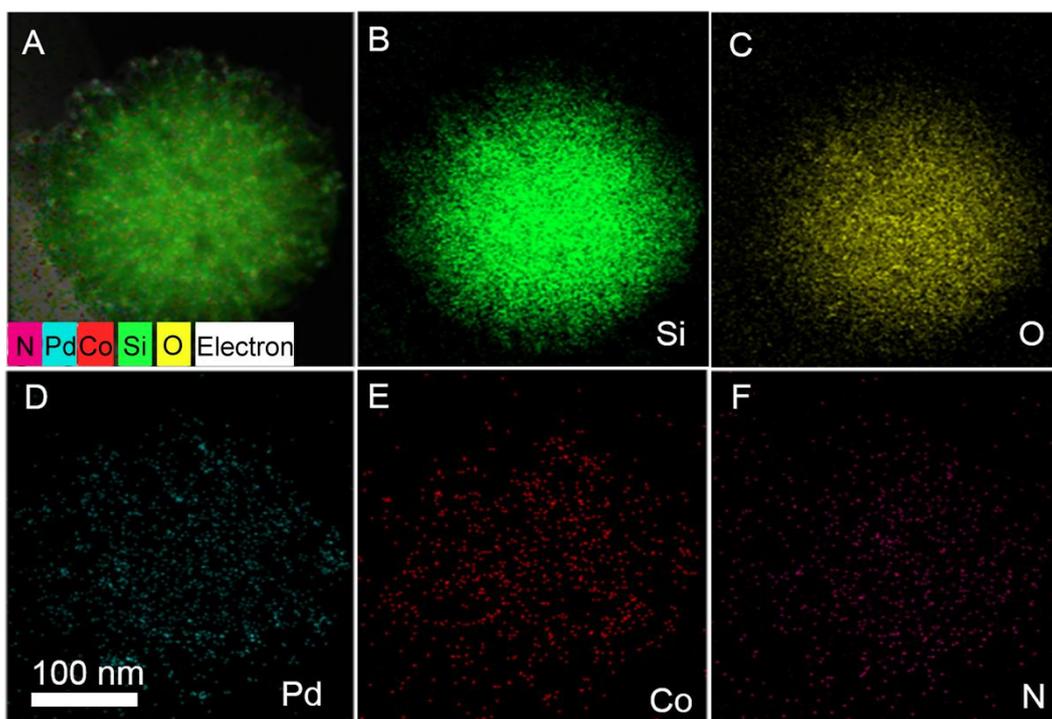


Fig. S1 (A) EDS layered image of PdCo@MSNs. (B-F) Corresponding EDS elemental distribution of Si, O, Pd, Co, and N atoms in PdCo@MSNs.

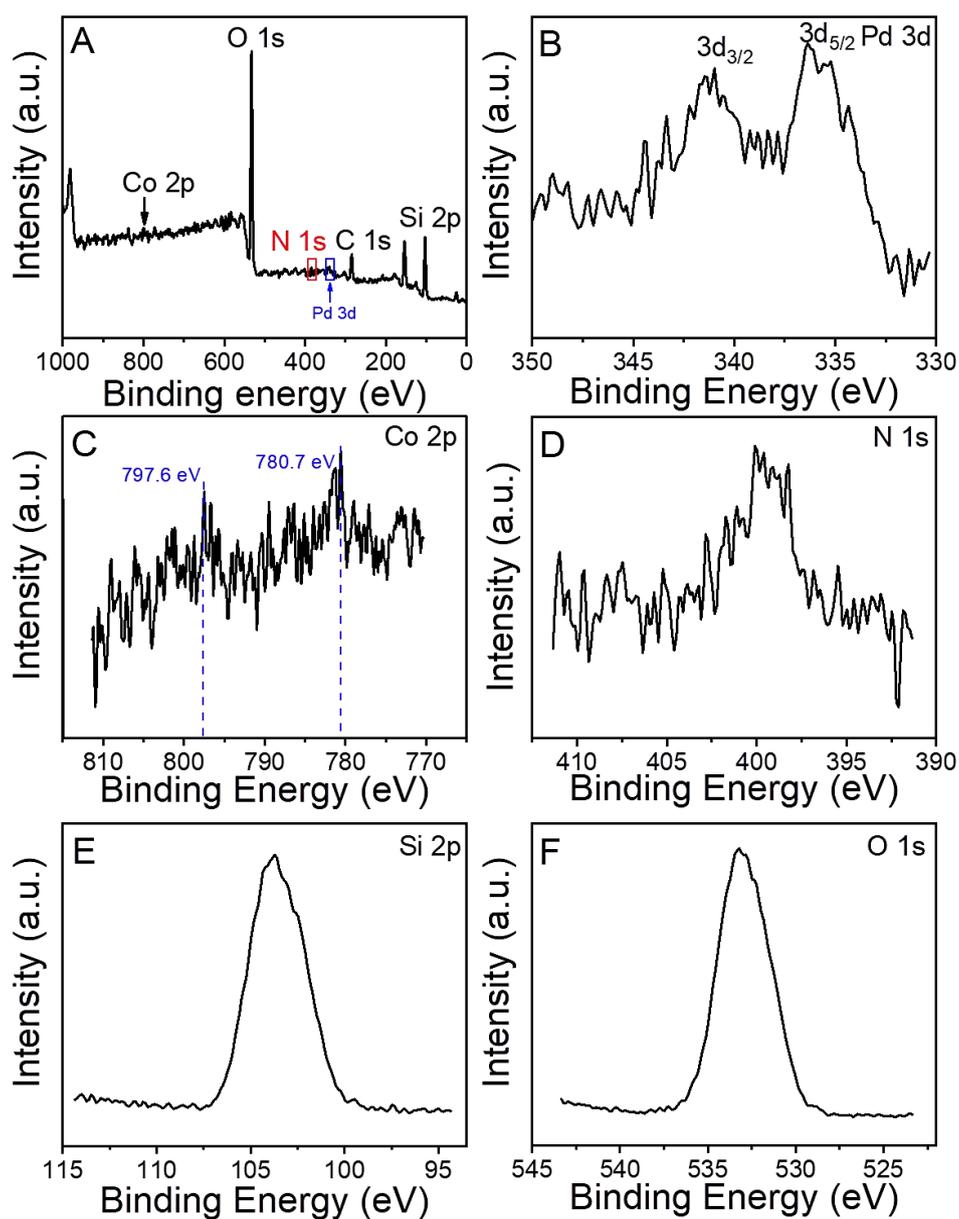


Fig. S2 (A) XPS spectrum of PdCo@MSNs. (B-C) XPS spectra of Pd, Co, N, Si, and O of PdCo@MSNs.

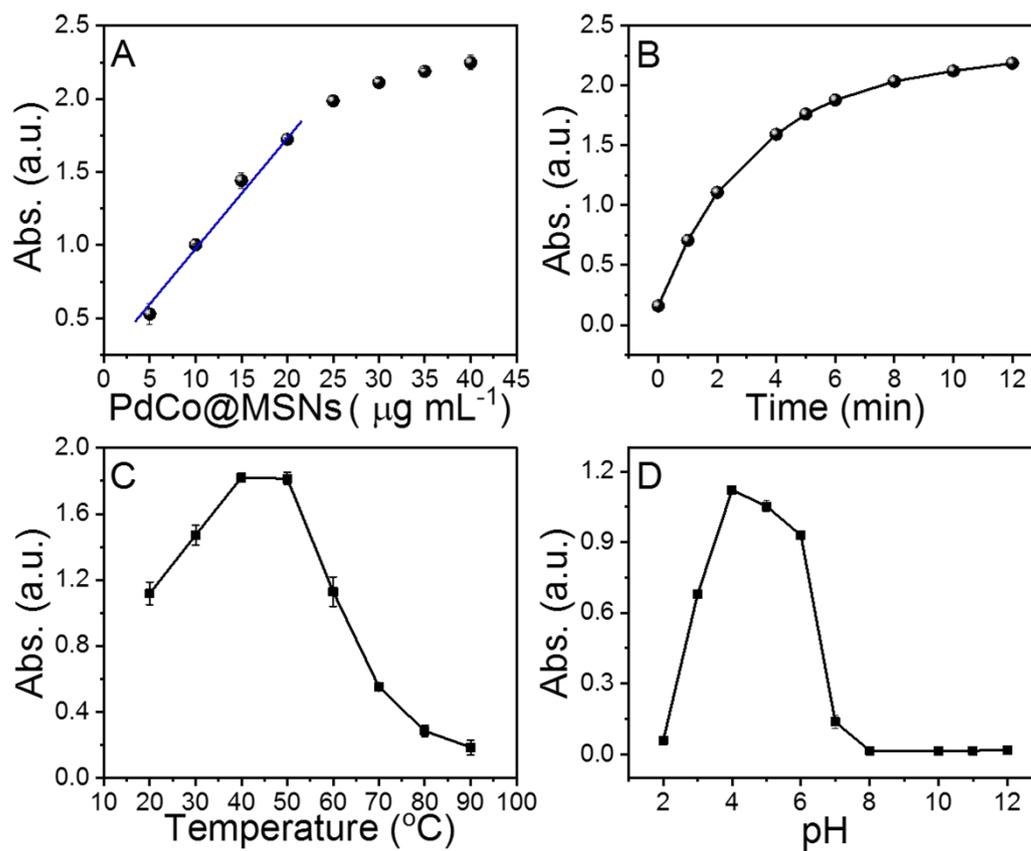


Fig. S3 Dependence of absorbance changes of TMB at 652 nm on (A) PdCo@MSNs concentration, (B) reaction time, (C) temperature, and (D) pH of the reaction mixture.

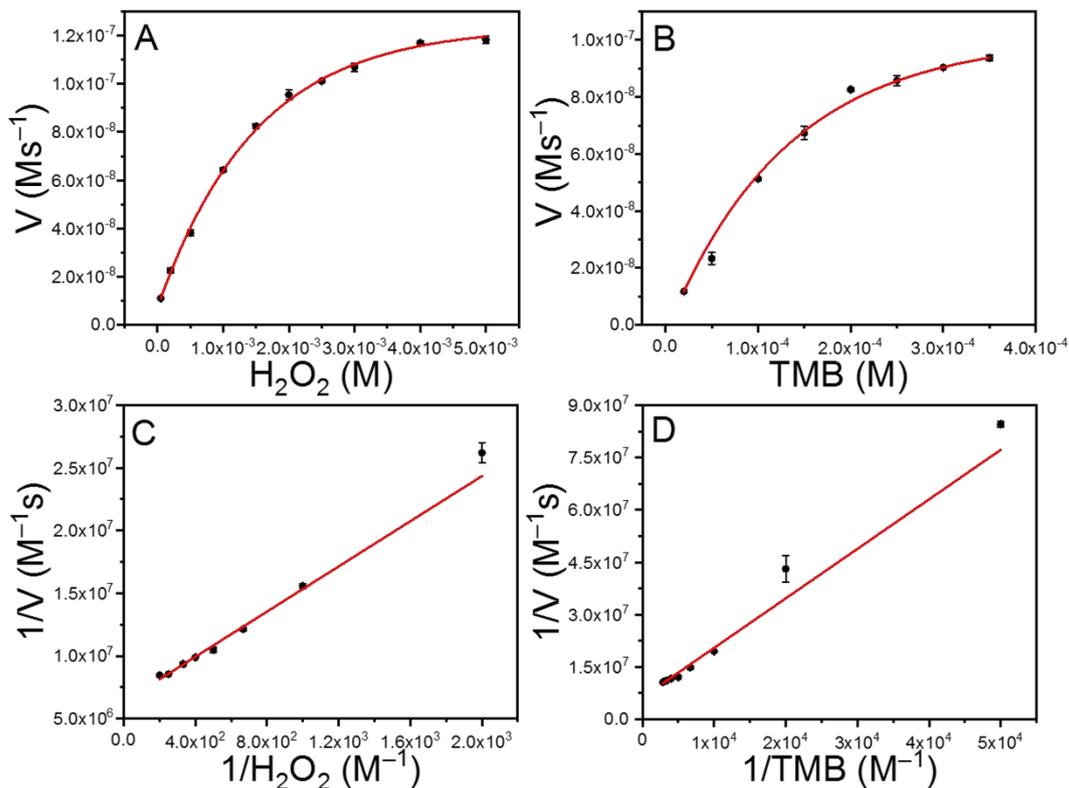


Fig. S4 Steady-state kinetic assay of PdCo@MSNs. Reaction velocity was measured in 2 mL phosphate buffer (pH 4.0) at 40 °C containing 20 $\mu\text{g mL}^{-1}$ of PdCo@MSNs. (A) TMB concentration was 0.3 mM, and H_2O_2 concentration was varied. (B) H_2O_2 concentration was 2 mM, and TMB concentration was varied. (C) Double-reciprocal plots, 0.3 mM of TMB and varying concentrations of H_2O_2 . (D) Double-reciprocal, 2 mM of H_2O_2 and varying concentrations of TMB.

Table S1 Comparison of the kinetics parameters for the POD-like activity of PdCo@MSNs with HRP.

Catalyst	Substrate	K_m (mM)	References
HRP	TMB	0.434	4
	H ₂ O ₂	3.70	
PdCo@MSNs	TMB	0.157	This work
	H ₂ O ₂	1.423	



Fig. S5 Digital photographs showing the generation of gas bubbles after 10 min incubation in a PBS solution (pH 4.0 and pH 7.0) containing $20 \mu\text{g mL}^{-1}$ of PdCo@MSNs and 2 mM of H_2O_2 or only 2 mM of H_2O_2 (control groups).

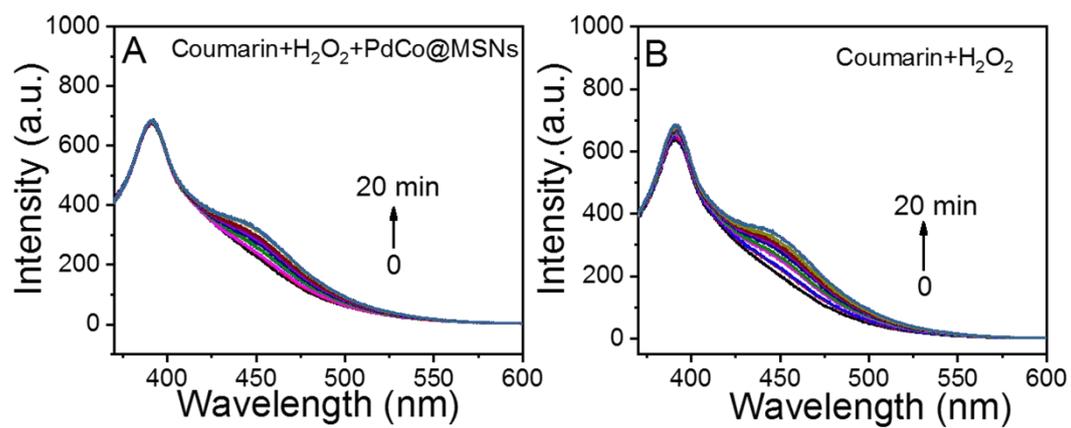


Fig. S6 Changes in fluorescence intensity in 20 min of 20 mM PBS (pH 4.0) reaction mixture containing (A) 200 μ M of coumarin, 2 mM of H₂O₂, and PdCo NPs; (B) 200 μ M of coumarin, 2 mM of H₂O₂.

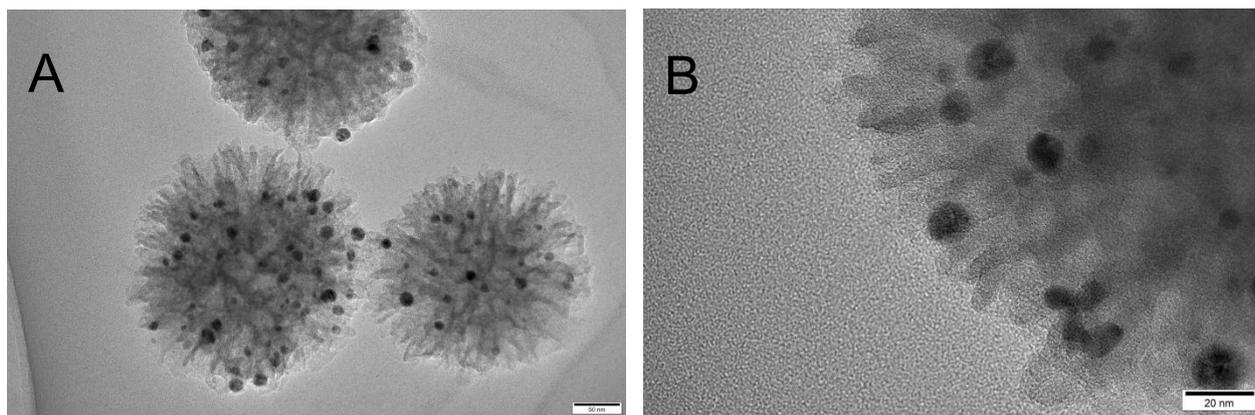


Fig. S7 (A) and (B) TEM images of PdCo@MSNs after acid-leaching treatment.

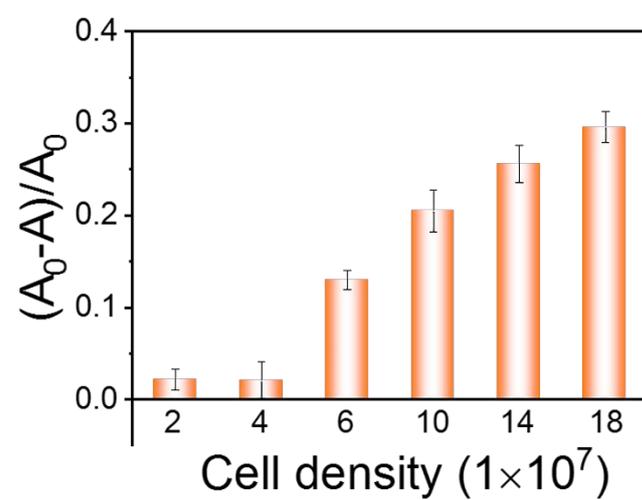


Fig. S8 Change in $(A_0 - A)/A_0$ with cell density. A, absorbance at 652 nm in the absence of cells. A_0 , absorbance at 652 nm in the presence of cells.

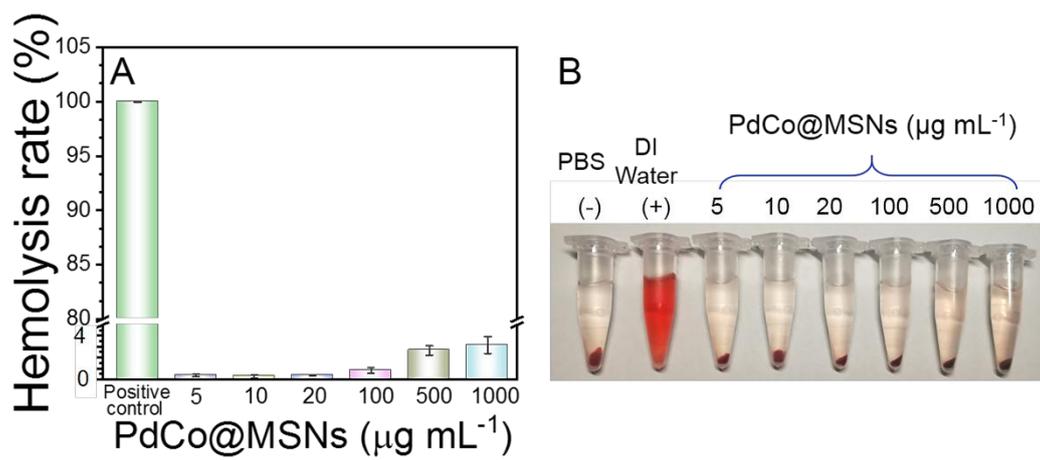


Fig. S9 (A) Hemolysis rate of RBCs incubated with PdCo@MSNs at different concentrations. (B) Optical image of RBCs incubated with PdCo@MSNs for 4 h.