Electronic Supplementary Information (ESI) for New Journal of Chemistry

Perovskite $LaCoO_3$ nanoparticles as enzyme mimetics: catalytic properties, mechanism and its application in biosensing for dopamine

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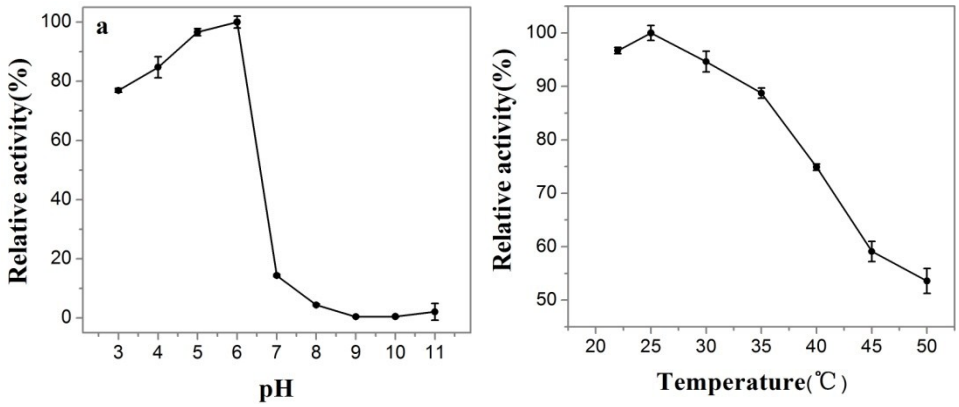

Fig. S1 Effects of (a) pH and (b) temperature on the peroxidase-like activity of LCO NPs.

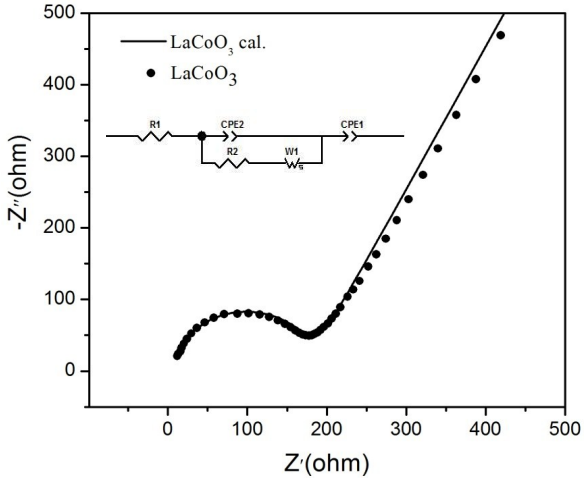

Fig. S2 (a) Nyquist plots of the LCO measured; The inset is the Equivalent circuit model of LCO modified electrode.

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Table S1. Comparison of the kinetic parameters of different artificial peroxidase and HRP using TMB as substrate

catalyst	K_m(mM)		V_{max}(10^{-8}M·s^{-1})		reference
	H_2O_2	TMB	H_2O_2	TMB	
HRP	3.7	0.43	8.71	10	1
Co_3O_4	24.64	0.3	7.30	7.82	2
$Co_XFe_{3-X}O_4$	0.078	0.024	0.793	0.564	3
LCO	15.0	0.24	35.0	34.9	This work

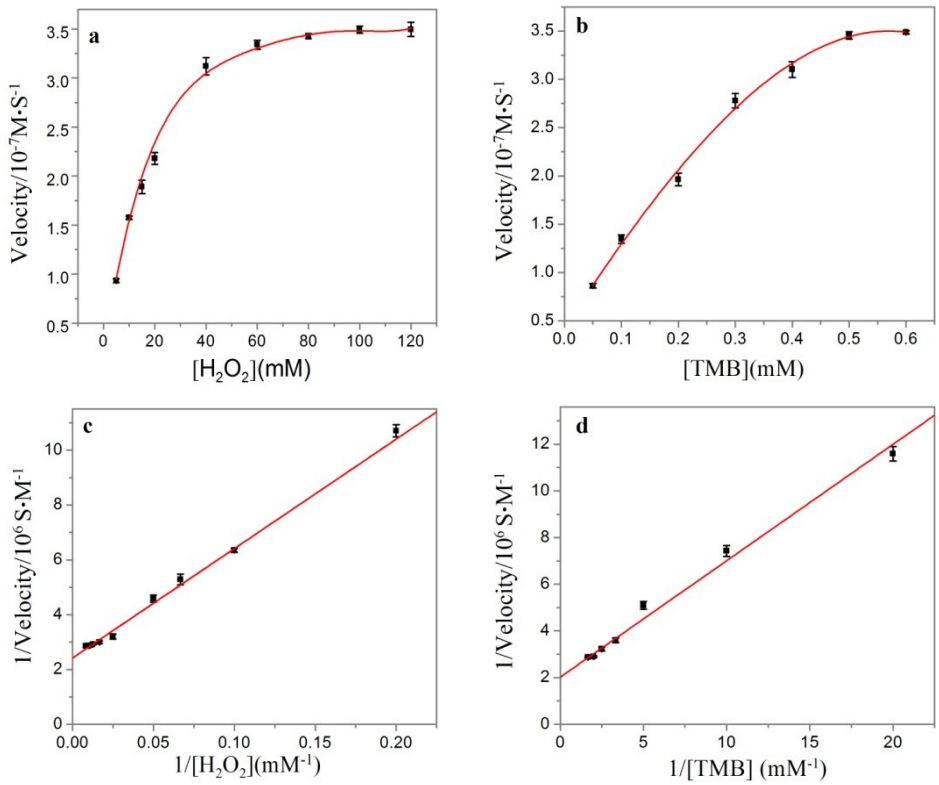

Fig. S3 Steady state kinetic assay of LCO NPs. (a) Constant concentration of H_2O_2 (100 mM) and the TMB concentration was varied (b) Constant concentration of TMB (0.5 mM) and the H_2O_2 concentration was varied. Double reciprocal plot of peroxidase mimic activity of LCO NPs with the (c) constant concentration of H_2O_2 (100 mM) and varying concentrations of TMB (d) constant concentration of TMB (0.5 mM) and varying concentrations of H_2O_2. The reactions were carried out with 10 μg/mL LCO NPs in 3 mL of 100mM NaAc-HAc buffer at pH=6.0.

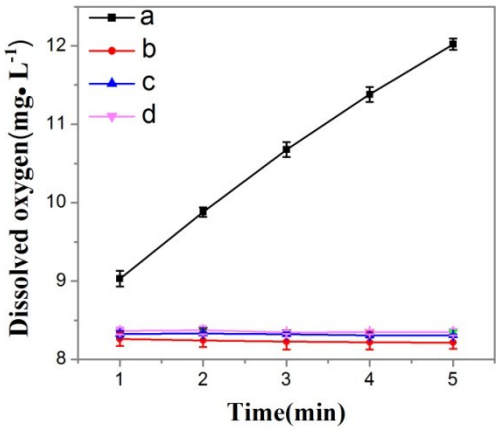

Fig. S4 Oxygen generation in different reaction systems: (a) LCO + H_2O_2, (b) LCO, (c) H_2O_2, (d) leachate of LCO + H_2O_2. Reaction conditions: 20 μg·mL^{-1} LCO NPs, 10 mM H_2O_2 in 100 mM Na_2HPO_4-NaH_2PO_4 buffer (pH 10.0).

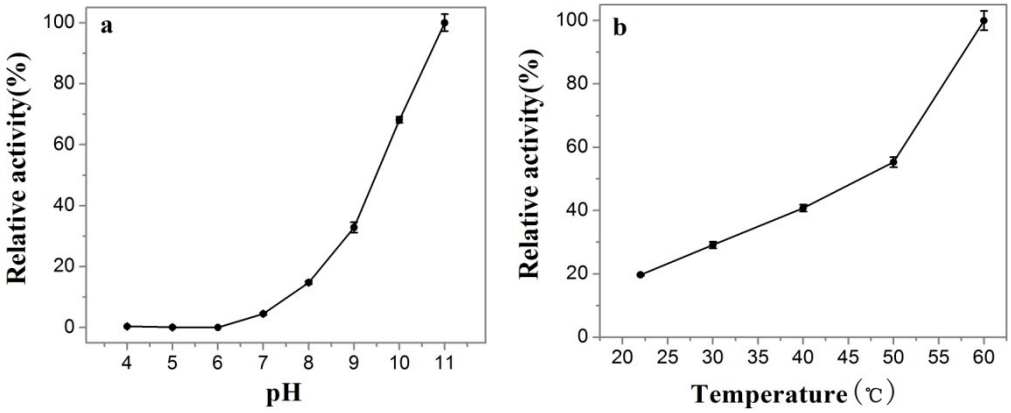

Fig. S5 Effects of (a) pH and (b) temperature on the catalase-like activity of LCO NPs.

References

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