Electronic Supplementary Material (ESI) for Analyst.

Supporting Materials

Nitrogen, Copper-doped Carbon Quantum Dots with Intrinsic Peroxidase-like Activity for Double-signals Detection of Phenol

Jinyan Du*, Shuangqing Qi, Tingting Fan, Ying Yang, Chaofeng Wang, Qin Shu, Shujuan Zhuo, Changqing Zhu*

Anhui Key Laboratory of Chemo-Biosensing, Key Laboratory of Functional Molecular Solids, Ministry of Education, College of Chemistry and Materials Science, Anhui Normal University, Wuhu, 241000, P R China.

*Corresponding authors, E-mail addresses: dujinyn@mail.ahnu.edu.cn (J. Y. Du), zhucq@mail.ahnu.edu.cn (C. Q. Zhu).

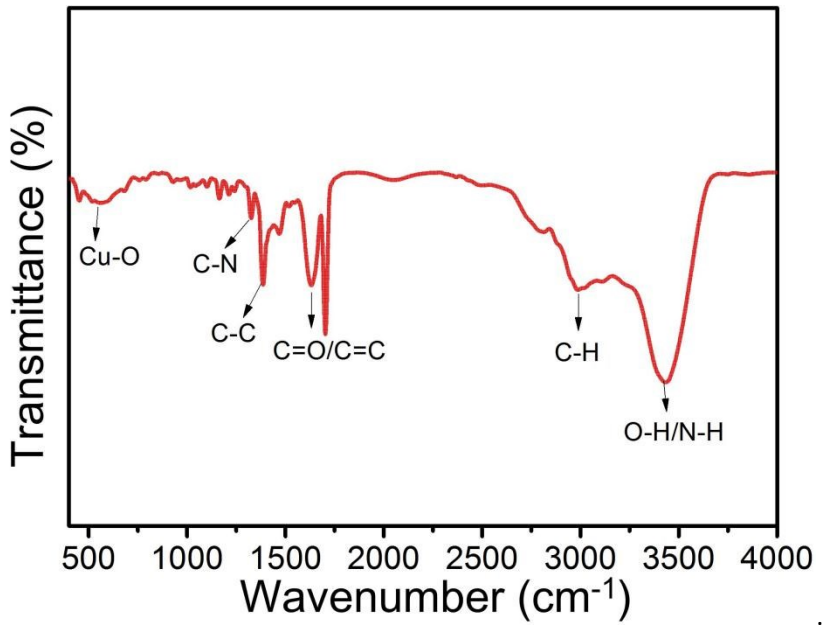

Fig. S1 FTIR spectrum of the N, Cu-CQDs.

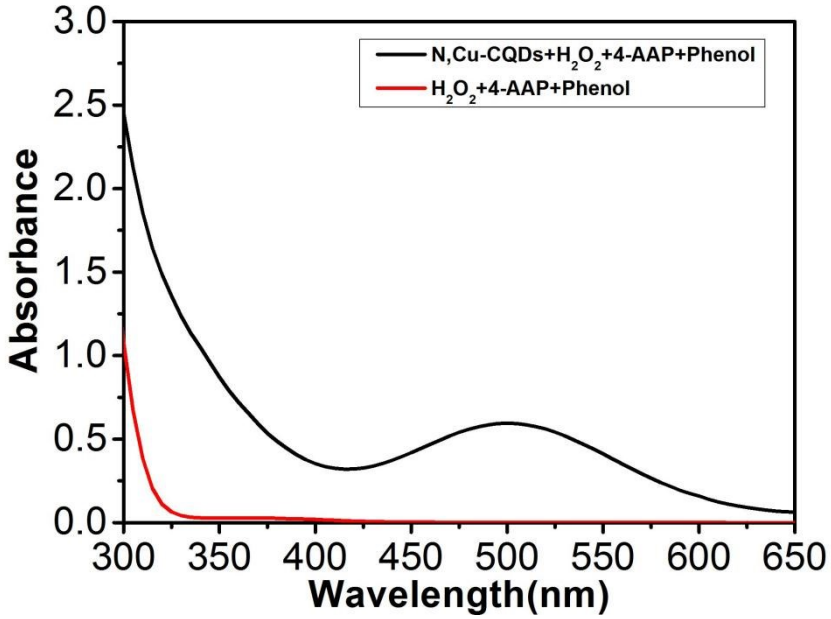

Fig. S2 The UV-vis absorption spectra of 4-AAP + H_2O_2 + phenol in the presence (black line) and absence (red line) of the N, Cu-CQDs.

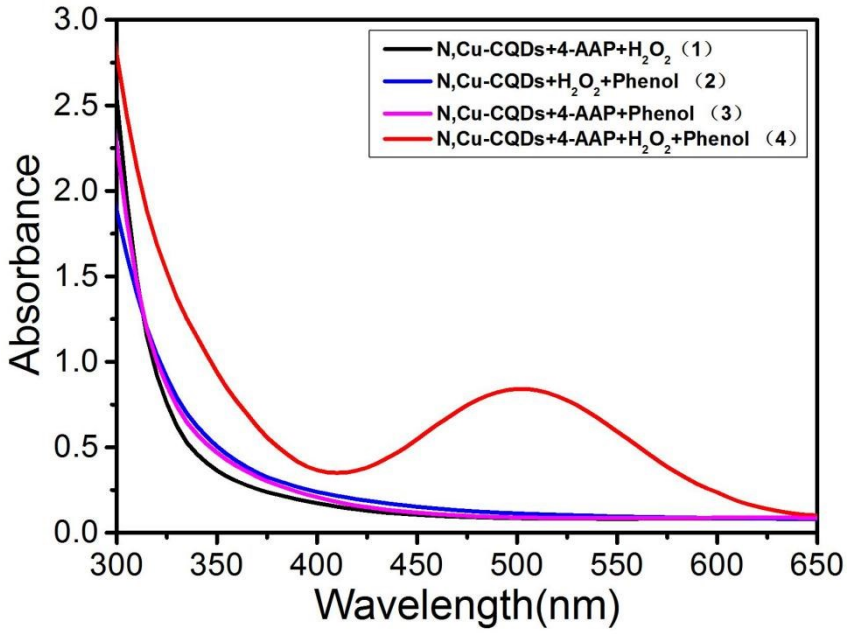

Fig. S3 The UV-vis absorption spectra of four different systems.

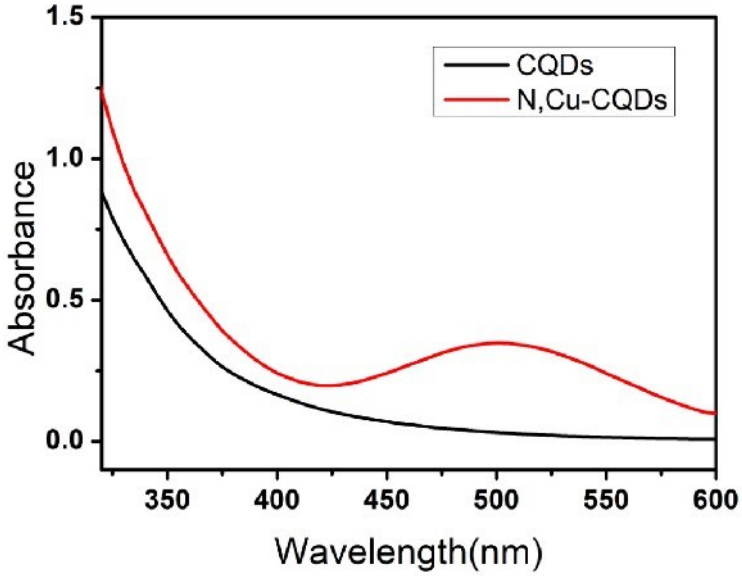

Fig. S4 The UV-vis absorption spectra of the 4-AAP + H_2O_2 +phenol in the presence of the Cu-free CQDs (black line) or the N, Cu-CQDs (red line).

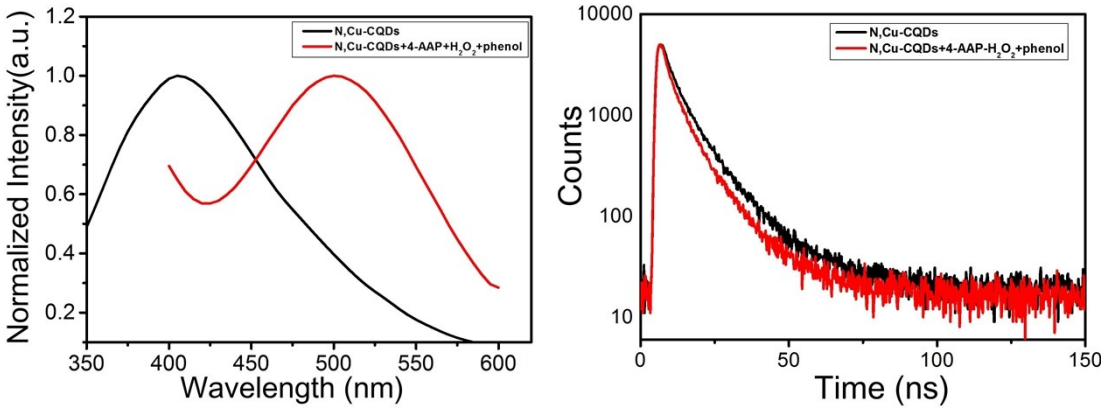

Fig. S5 (A) Fluorescence emission spectrum of the N, Cu-CQDs (black line) and UV-vis absorption spectrum of the N, Cu-CQDs/4-AAP/H_2O_2 /phenol solution (red line). (B) Time-resolved decays of the N, Cu-CQDs before (black line) and after (red line) addition of H_2O_2, 4-AAP and phenol.

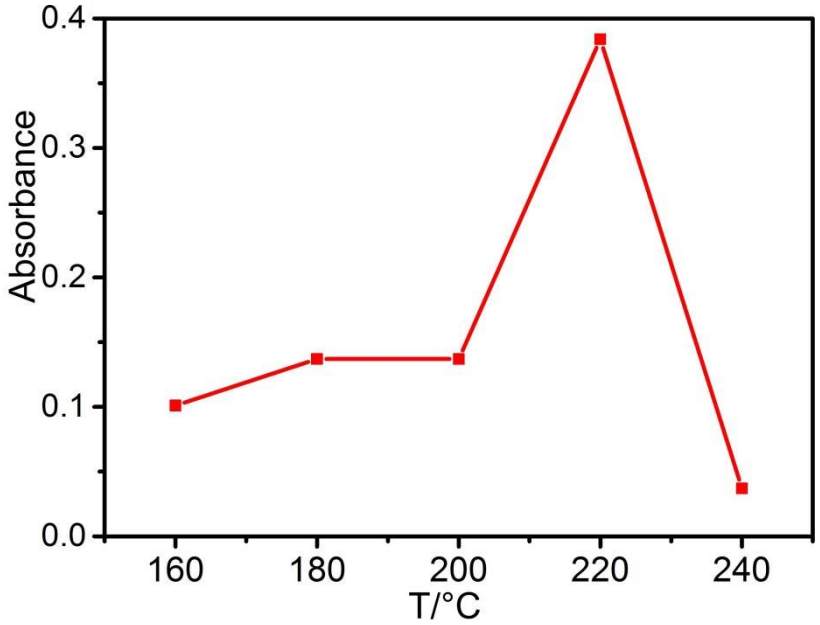

Fig. S6 Dependency of catalytic activity of N, Cu-CQDs on synthetic temperature.

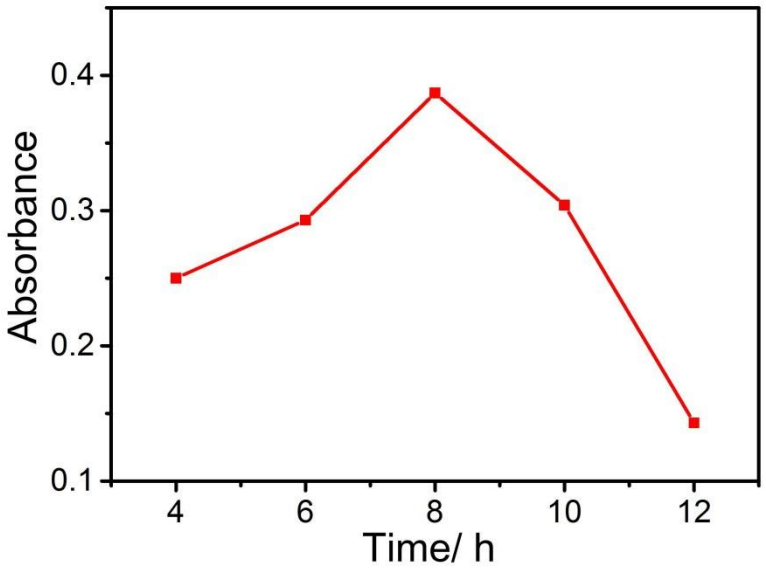

Fig. S7 Dependency of catalytic activity of N, Cu-CQDs on reaction time.

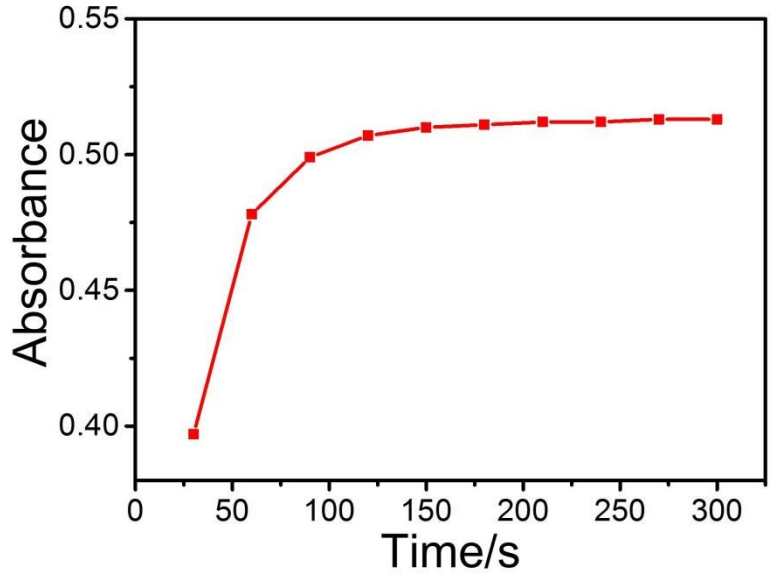

Fig. S8 Time-dependent absorbance of the N, Cu-CQDs/4-AAP/H_2O_2 system with the addition of phenol at room temperature.

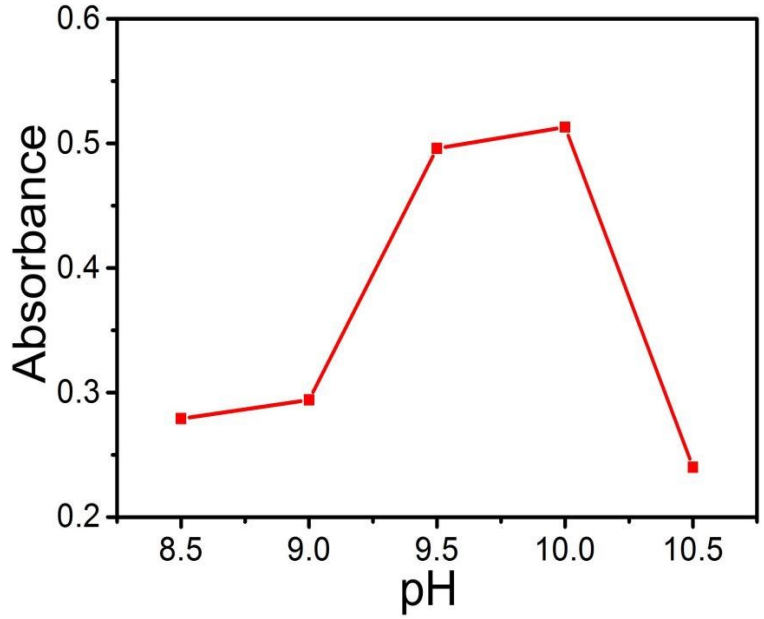

Fig. S9 Absorption response of N, Cu-CQDs/phenol/4-AAP/H_2O_2 system at different pH values.

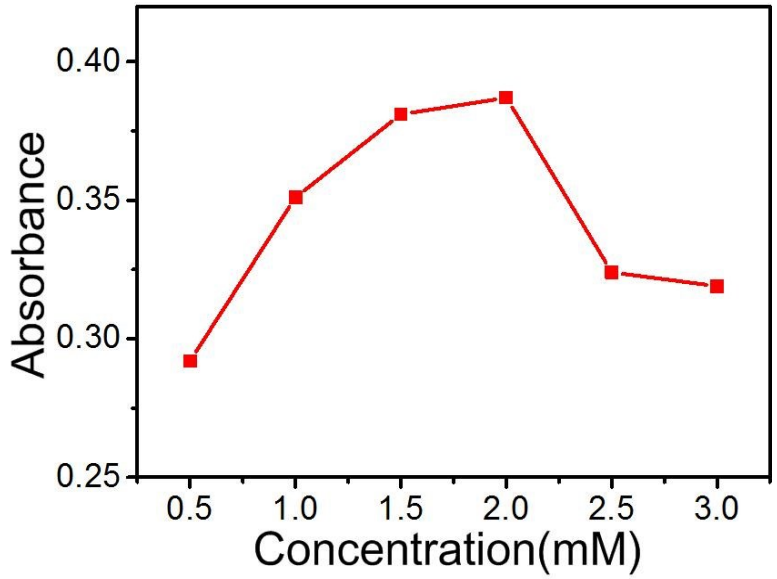

Fig. S10 4-AAP-dependent absorbance changes at 505 nm during the assay for peroxidase activity of the N, Cu-CQDs.

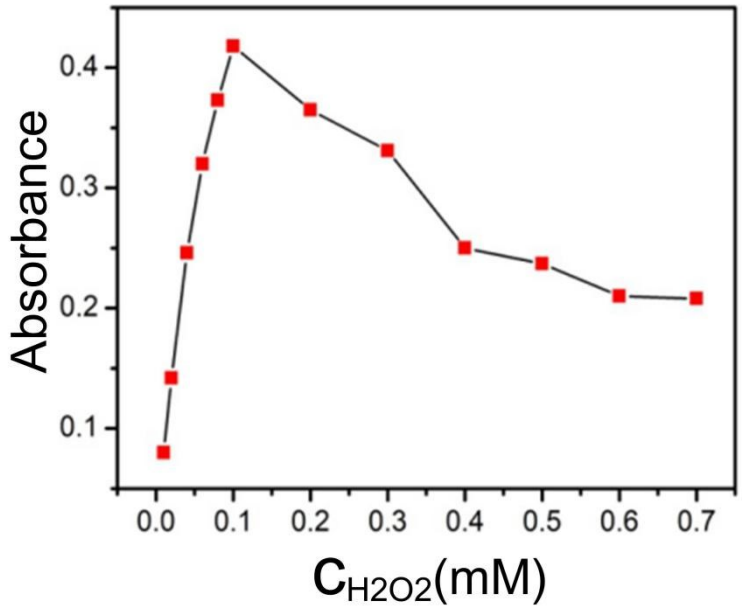

Fig. S11 The H_2O_2-dependent absorbance changes at 505 nm during the assay for peroxidase activity of the N, Cu-CQDs.

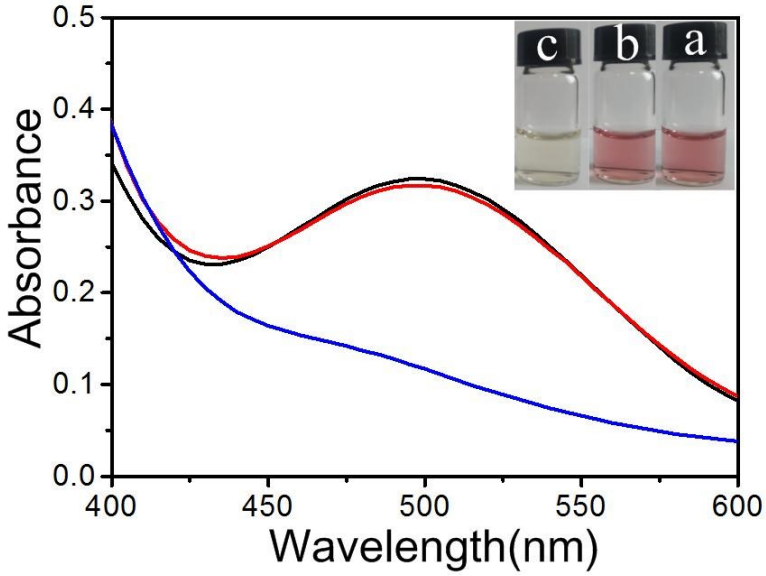

Fig. S12 The UV-vis absorption spectra of the N, Cu-CQDs/4-AAP/H_2O_2/phenol (black line, photograph a), N, Cu-CQDs/4-AAP/H_2O_2/phenol/$K_2Cr_2O_7$ (red line, photograph b) and N, Cu-CQDs/4-AAP/H_2O_2/phenol/TBA (blue line, photograph c).