

Supplementary Material

For

Chemical redox-cycling based colorimetric and smartphone dual-channel sensing platform for phenol detection by using bifunctional copper-based metal-organic frameworks

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Experimental

Reagents and apparatus

Copper (II) sulfate pentahydrate and hydrogen peroxide (H_2O_2) were supplied by Sangon Biotech. Co., Ltd. (Shanghai, China). Phenol, methanol, 4-aminoantipyrine (4-AAP), copper (II) nitrate trihydrate, polyvinylpyrrolidone (PVP), 1, 3, 5-benzenetricarboxylic acid (BTC) and other chemical reagents were provided by Shanghai Aladdin Bio-Chem Technology Co., Ltd. (Shanghai, China). Ultrapure water was employed for all experiments.

UV-Vis absorption spectra was recorded with a U-3900 spectrophotometer (produced by Hitachi Co. Ltd., Japan). Scanning electron microscopy (SEM) image was obtained from a Hitachi S-4800 SEM (Tokyo, Japan). X-ray diffraction (XRD) pattern was measured on a Rigaku/mini flex-600 diffractometer, by utilizing Cu-K α radiation ($\lambda=1.5418 \text{ \AA}$). X-ray photoelectron spectroscopy (XPS) characterization was accomplished on a K-Alpha X-ray photoelectron spectrometer (Thermo Fisher Scientific Co., USA).

Supporting Figures

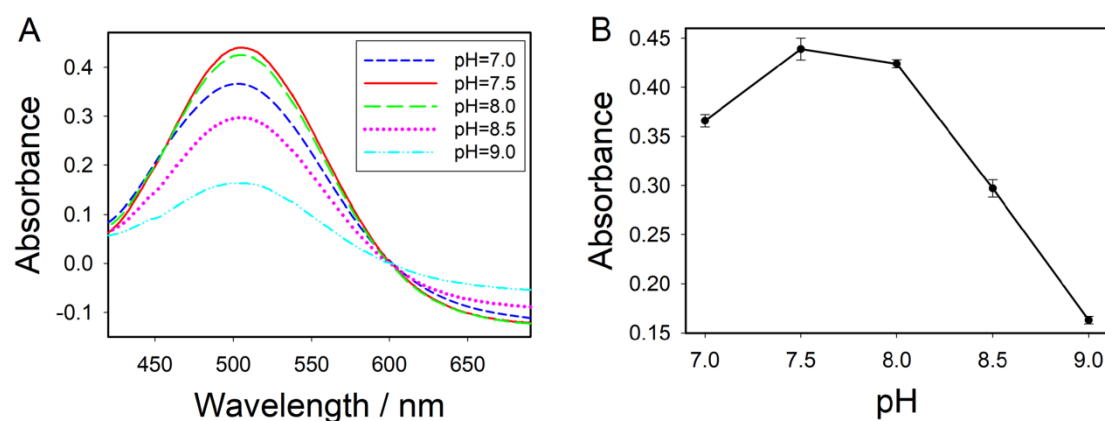


Fig. S1 (A) UV-Visible absorption spectra of Cu²⁺-H₂O₂-4-AAP-phenol system under different pH conditions (pH = 7.0 - 9.0). (B) Absorption intensity at 505 nm versus pH values.

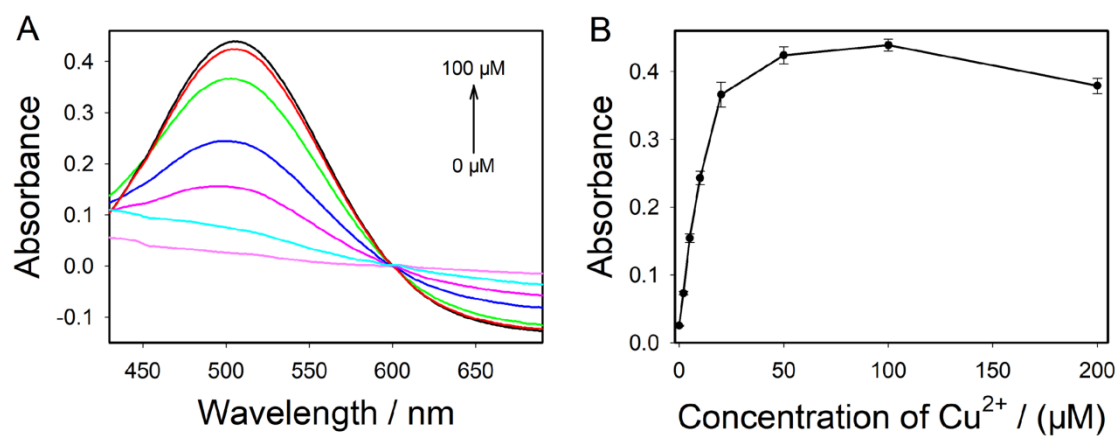


Fig. S2 (A) UV-Visible absorption spectra of Cu^{2+} - H_2O_2 -4-AAP-phenol system under different Cu^{2+} concentrations. (B) Absorption intensity at 505 nm versus Cu^{2+} concentrations.

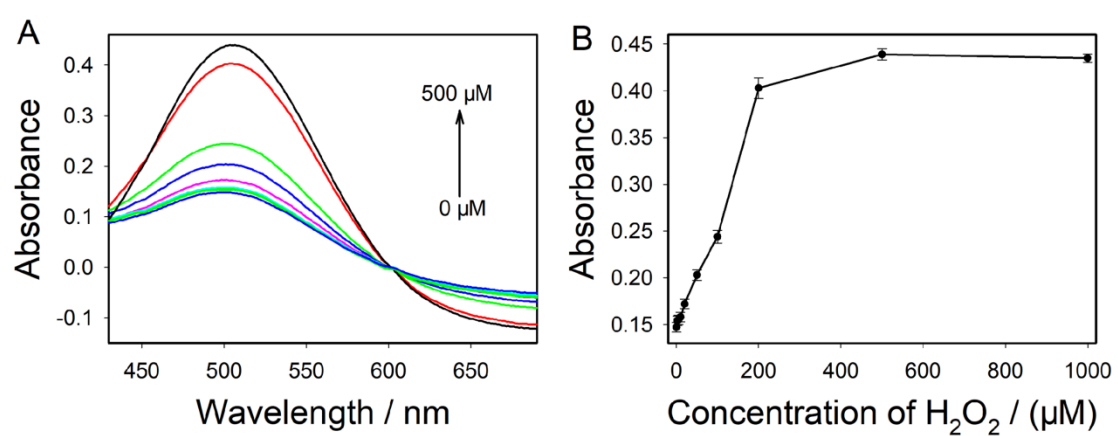


Fig. S3 (A) UV-Visible absorption spectra of Cu^{2+} - H_2O_2 -4-AAP-phenol system under different H_2O_2 concentrations. (B) Absorption intensity at 505 nm versus H_2O_2 concentrations.