

**Highly selective and sensitive recognition of histidine based on
the oxidase-like activity of Cu²⁺ ions**

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Supporting Information

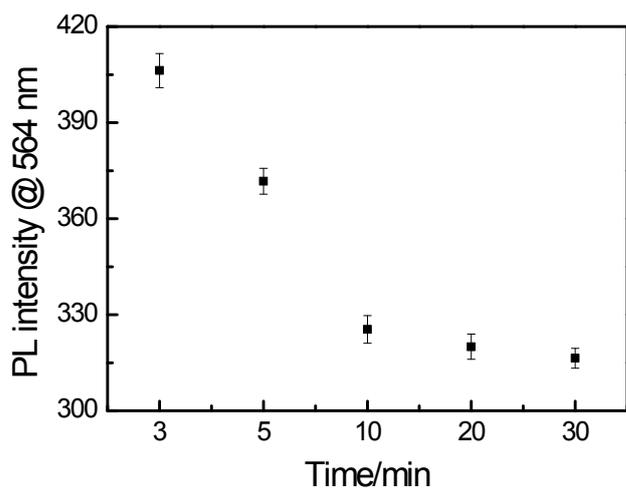


Fig.S1 The relationship between PL intensity @564 nm and the interaction time of His towards Cu^{2+} ions. $[\text{Cu}^{2+} \text{ ions}] = 0.5 \mu\text{M}$; $[\text{His}] = 5 \mu\text{M}$; $[\text{OPD}] = 0.5 \text{ mM}$; temperature of $65 \text{ }^\circ\text{C}$; 50 mM Tris-HCl of pH 7.4 buffer solution containing 15% acetonitrile (by volume).

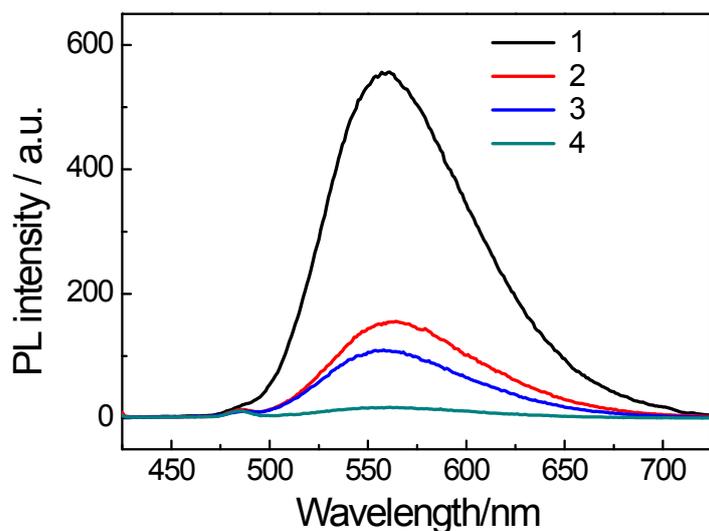


Fig. S2 The comparisons of the OPD- Cu^{2+} (1 and 2) and only OPD (3 and 4) in the presence (1 and 3) or absence (2 and 4) of dissolved oxygen. Experimental conditions: $[\text{OPD}] = 0.5 \text{ mM}$; temperature of $65 \text{ }^\circ\text{C}$; 50 mM Tris-HCl buffer solution of pH 7.4 containing 15% acetonitrile (by volume); reaction time of 1 h. $[\text{Cu}^{2+}] = 0.5 \mu\text{M}$ for 1 and 2. N_2 gas was continuously bubbled during the whole reaction process for removing dissolved oxygen.

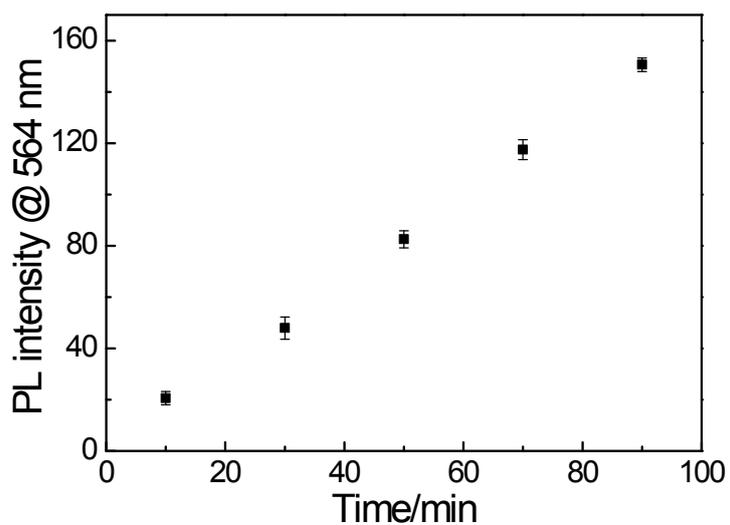


Fig. S3 The reaction time effect on the PL intensity at 564 nm of the OPD system in the absence of Cu^{2+} ions. Experimental conditions: $[\text{OPD}] = 0.5 \text{ mM}$; temperature of $65 \text{ }^\circ\text{C}$; 50 mM Tris-HCl buffer solution of pH 7.4 containing 15% acetonitrile (by volume).

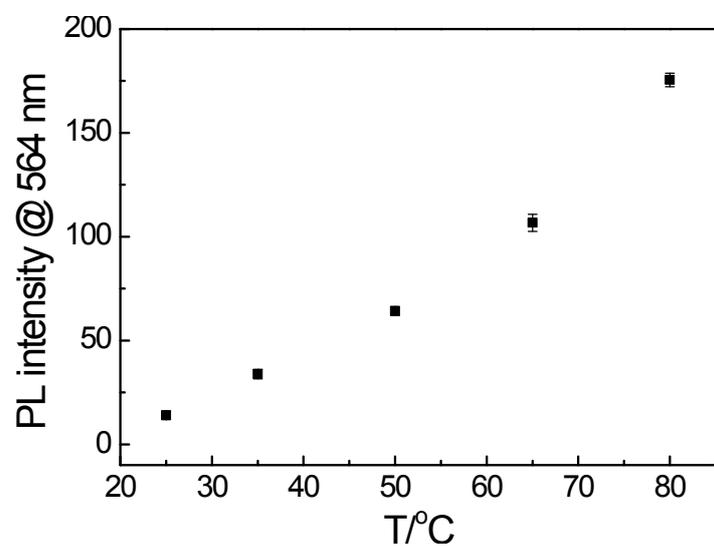


Fig. S4 Temperature effect on the PL intensity at 564 nm of the OPD system in the absence of Cu^{2+} ions. Experimental conditions: $[\text{OPD}] = 0.5 \text{ mM}$; 50 mM Tris-HCl buffer solution of pH 7.4 containing 15% acetonitrile (by volume); the reaction time of 1 h.

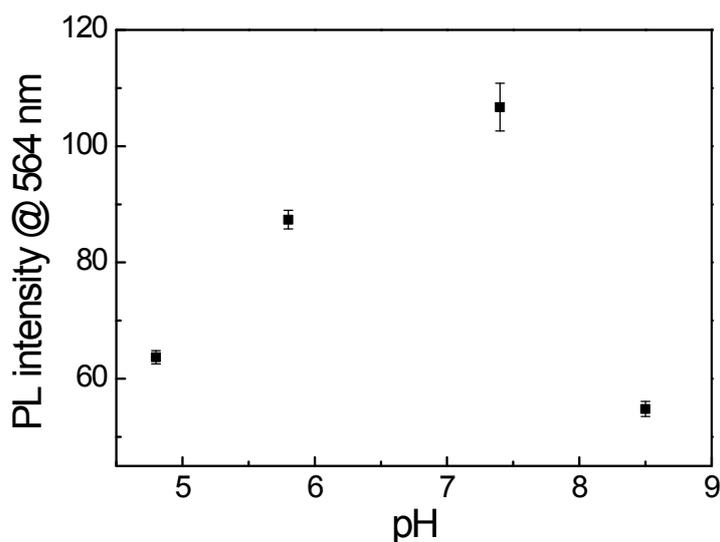


Fig. S5 pH effect on the PL intensity at 564 nm of the OPD system in the absence of Cu^{2+} ions. Experimental conditions: $[\text{OPD}] = 0.5 \text{ mM}$; temperature of $65 \text{ }^\circ\text{C}$; the reaction time of 1 h. 200 mM NaOAc-HOAc and 50 mM Tris-HCl buffer solution were employed for controlling pH of the system.

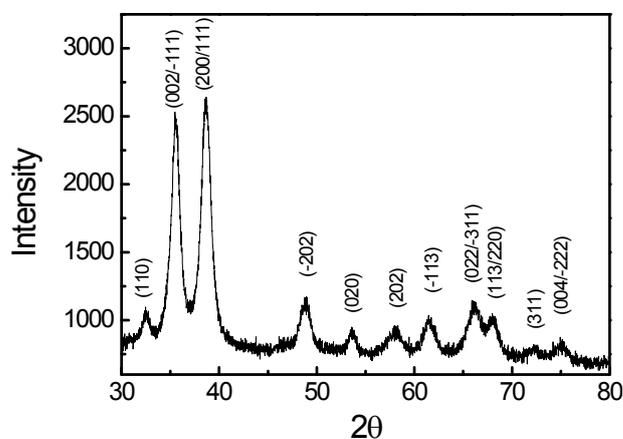


Fig. S6 XRD of the as-prepared CuO nanoparticles.

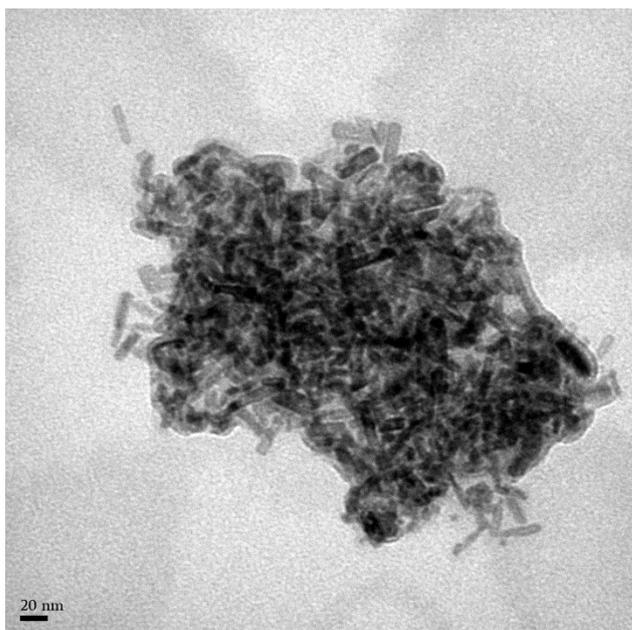


Fig. S7 TEM image of the as-prepared CuO nanoparticles.

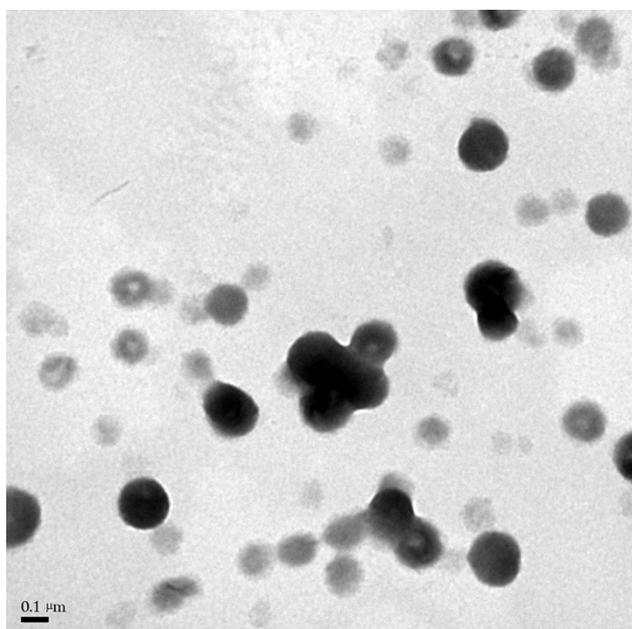


Fig. S8 TEM image of Cu nanoparticles *in situ* formed in Cu²⁺- OPD system when certain amount of ascorbic acid was added.

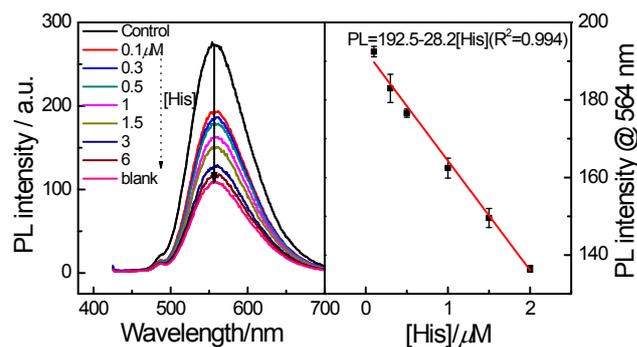


Fig. S9 His concentration-dependent PL intensity changes at 564 nm wavelength of the Cu^{2+} -OPD system (a), and linear calibration plot between PL intensity @ 564 nm and His concentration (b). The reaction time of 1 h. $[\text{Cu}^{2+} \text{ ions}] = 0.1 \mu\text{M}$; $[\text{OPD}] = 0.5 \text{ mM}$; temperature of $65 \text{ }^\circ\text{C}$; 50 mM Tris-HCl of pH 7.4 buffer solution containing 15% acetonitrile (by volume).

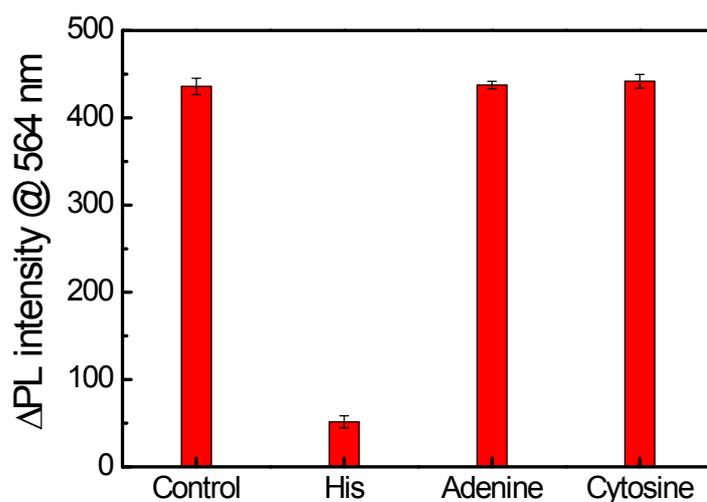


Fig. S10 The comparison of ΔPL intensity of the Cu^{2+} -OPD system in the presence of His, Adenine and Cytosine, respectively. The reaction time was set as 1 h. His, Adenine and Cytosine concentrations were $15 \mu\text{M}$; $[\text{Cu}^{2+}] = 0.5 \mu\text{M}$; $[\text{OPD}] = 0.5 \text{ mM}$; temperature of $65 \text{ }^\circ\text{C}$; 50 mM Tris-HCl buffer solution of pH 7.4 containing 15% acetonitrile (by volume). Note that, ΔPL was obtained from that the PL intensity at 564 nm of every group subtracted that of blank (the OPD system in the absence of Cu^{2+} ions).