Supporting information

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Table S1 CuNCs-based fluorescence sensors

Capping ligand	EX/EM (nm)	Formation time	Temperature	Sensing	Reference
BSA	325/410	6-8 h	55 ℃	Pb^{2+} quenched sensor	1
BSA	330/407	8 h	55 ℃	kojic acid quenched sensor	2
Trypsin	363/455	12 h	100 ℃	pH sensor	3
DNA	344/593	15 min	Room	Mismatch type in a DNA	4
Tannic acid	360/430	6 h	50 ℃	Fe^{3+} quenched sensor	5
BSA	524/625	4 h	Room	pH sensor	6
DPA	391/673	About 1 minute	Room	Cu^{2+} turn-on sensor	Our method

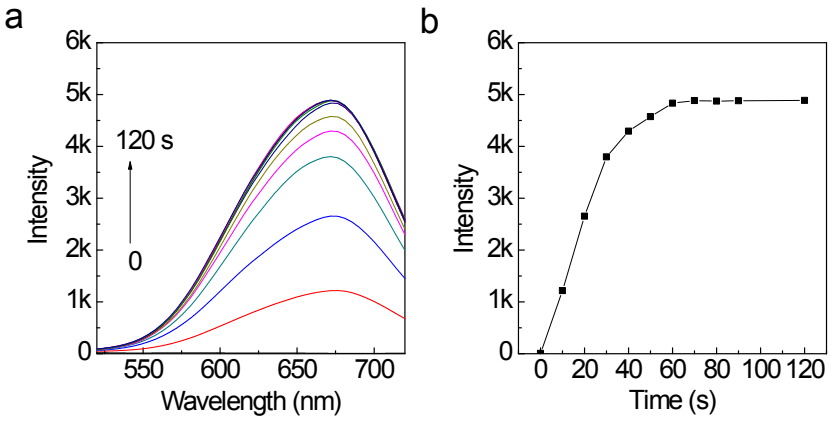

Fig. S1 Fluorescence emission spectra (a) and intensity (b) at 673 nm change as function of time.

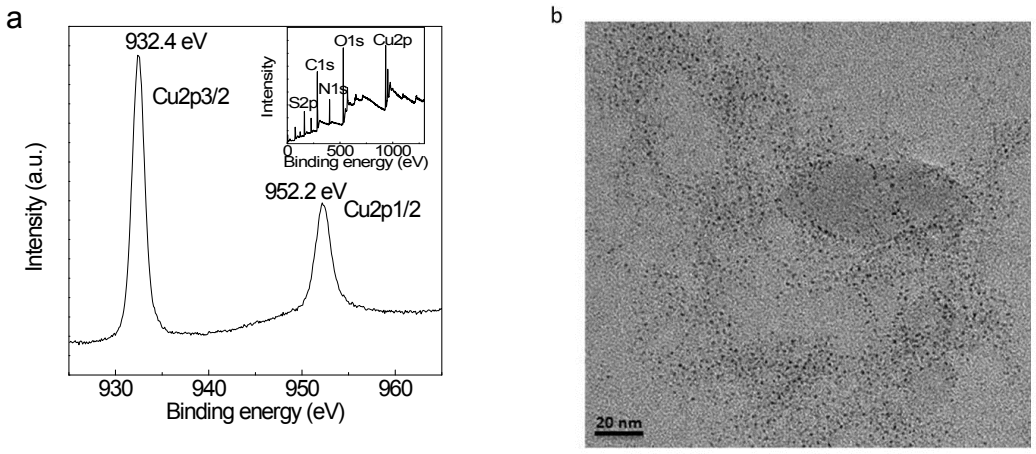

Fig. S2 XPS study (The inset shows XPS survey of the CuNCs-product) (a) and TEM image (b) of the as-prepared CuNCs.

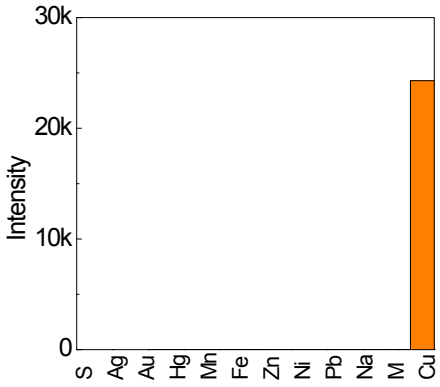

Fig. S3 Selectivity of the sensing system to Cu^{2+} over other metal ions. S indicates the noise signal. M indicates the mixture of other metal ions.

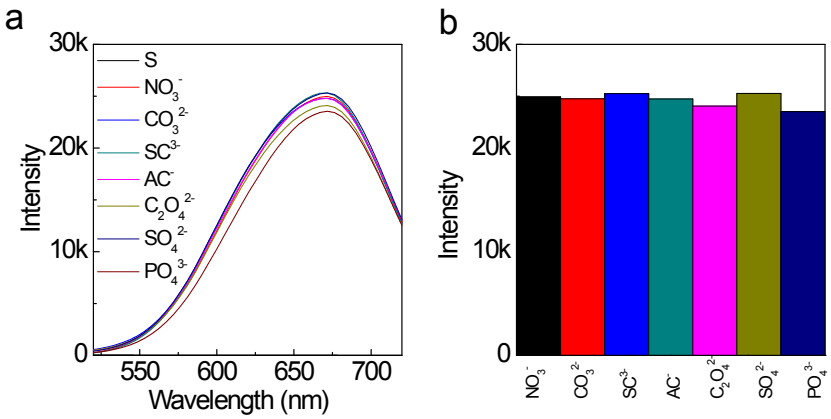

Fig. S4 Fluorescence emission spectra (a) and the fluorescence intensity at 673 nm (b) of the sensing system for Cu^{2+} in the presence of various anions.

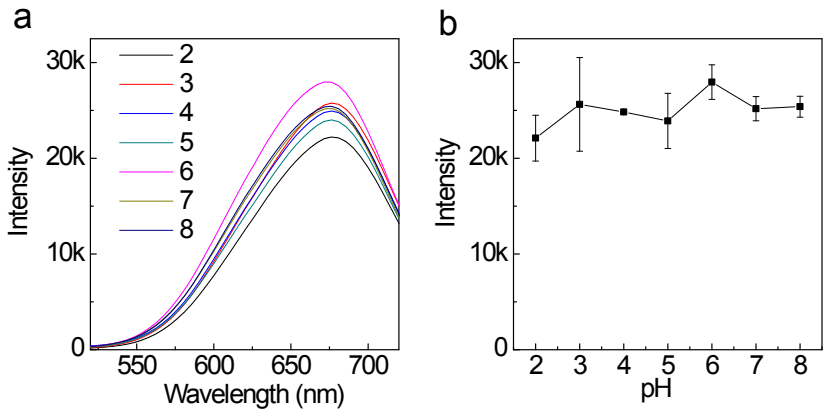

Fig. S5 Fluorescence emission spectra of the sensing system in the presence of 10 ppm of Cu^{2+} at different pH values (a) and the emission intensity at 673 nm as a function of pH (b).

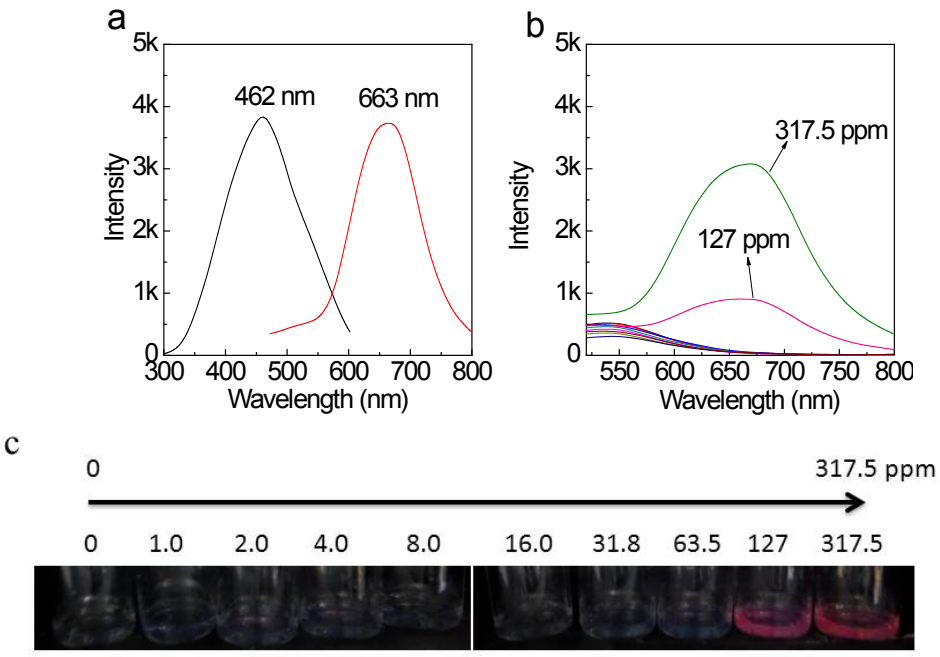

Fig. S6 Typically optimum fluorescence excitation (left), emission (right) spectra of BSA-CuNCs (a); the fluorescence spectra of the as formed products by the same synthesis method with different concentration of Cu^{2+}, b; The photograph of the corresponding sensing products with different concentration of Cu^{2+} under a 365 nm UV lamp (c).

Table S2 Detection of Cu^{2+} in the presence other metal ions

Add (ppm)	Found (ppm)	Average (ppm)	Recovery (%)
1	0.87, 0.94, 1.05	0.956±0.117	95.6±11.7
5	4.65, 4.97, 5.11	4.88±0.29	97.6±5.7
10	10.29, 10.64, 10.09	10.34±0.28	103.4±2.8

Note: Other metal ions are including Ag^{+}, Au^{3+}, Hg^{2+}, Mn^{2+}, Fe^{3+}, Zn^{2+}, Ni^{2+}, Pb^{2+}, Na^{+}

References

1 N. Goswami; A. Giri; M.S. Bootharaju; P.L. Xavier; T. Pradeep, S.K. Pal. *Anal Chem*, 2011, **83**, 9676-9680.

2 Z. Gao; R.X. Su; W. Qi; L.B. Wang; Z.M. He. *Sensor Actuat B-Chem*, 2014, **195**, 359-364.

3 W. Wang; F. Leng; L. Zhan; Y. Chang; X.X. Yang; J. Lan; C.Z. Huang. *Analyst*, 2014, **139**, 2990-2993.

4 X. Jia; J. Li; L. Han; J. Ren; X. Yang; E. Wang. *Acs Nano*, 2012, **6**, 3311-3317.

5 H. Cao; Z. Chen; H. Zheng; Y. Huang. *Biosens Bioelectron*, 2014, **62C**, 189-195.

6 Chen, C.; Wang, R. Y.; Guo, L. Q.; Fu, N. Y.; Dong, H. J.; Yuan, Y. F. *Org Lett,* 2011**, 13**, (5), 1162-1165.