

## Electronic Supporting Information (ESI)

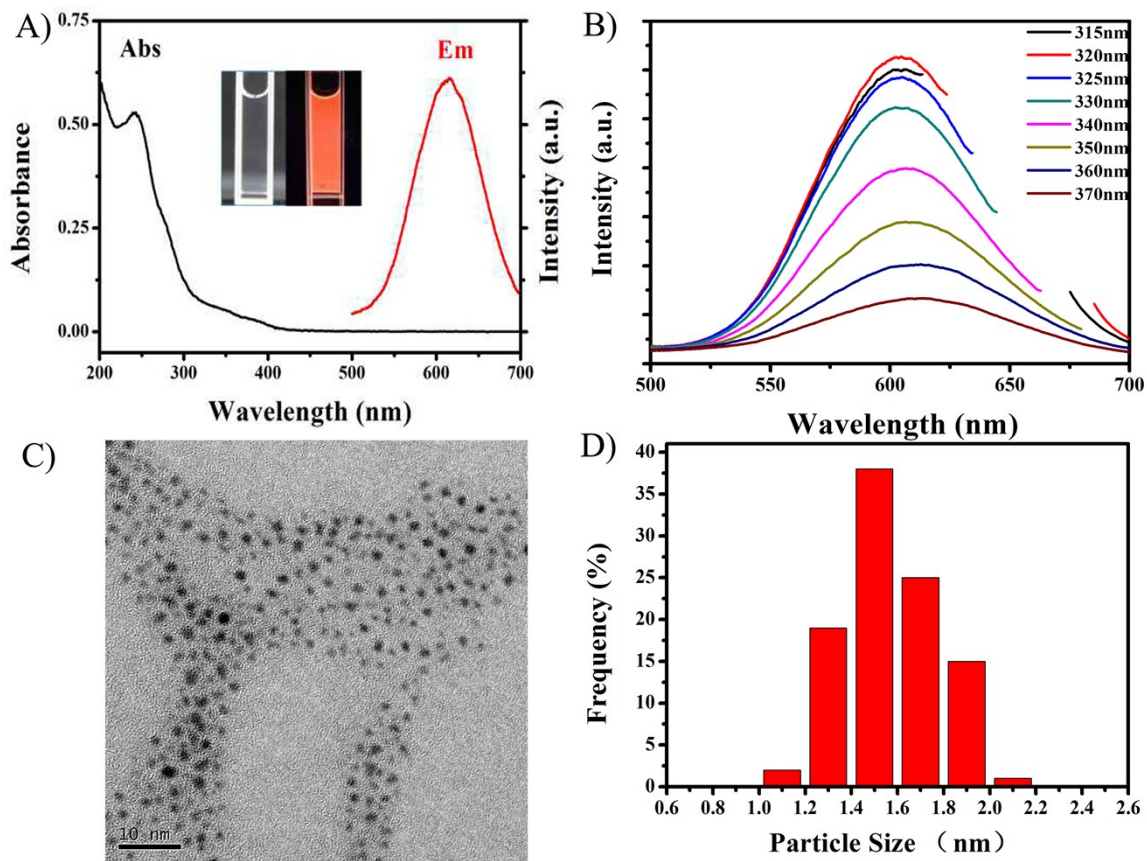
### **Bimetallic Gold-Silver Nanoclusters Fluorescent Probes for Cr(III) and Cr(VI)**

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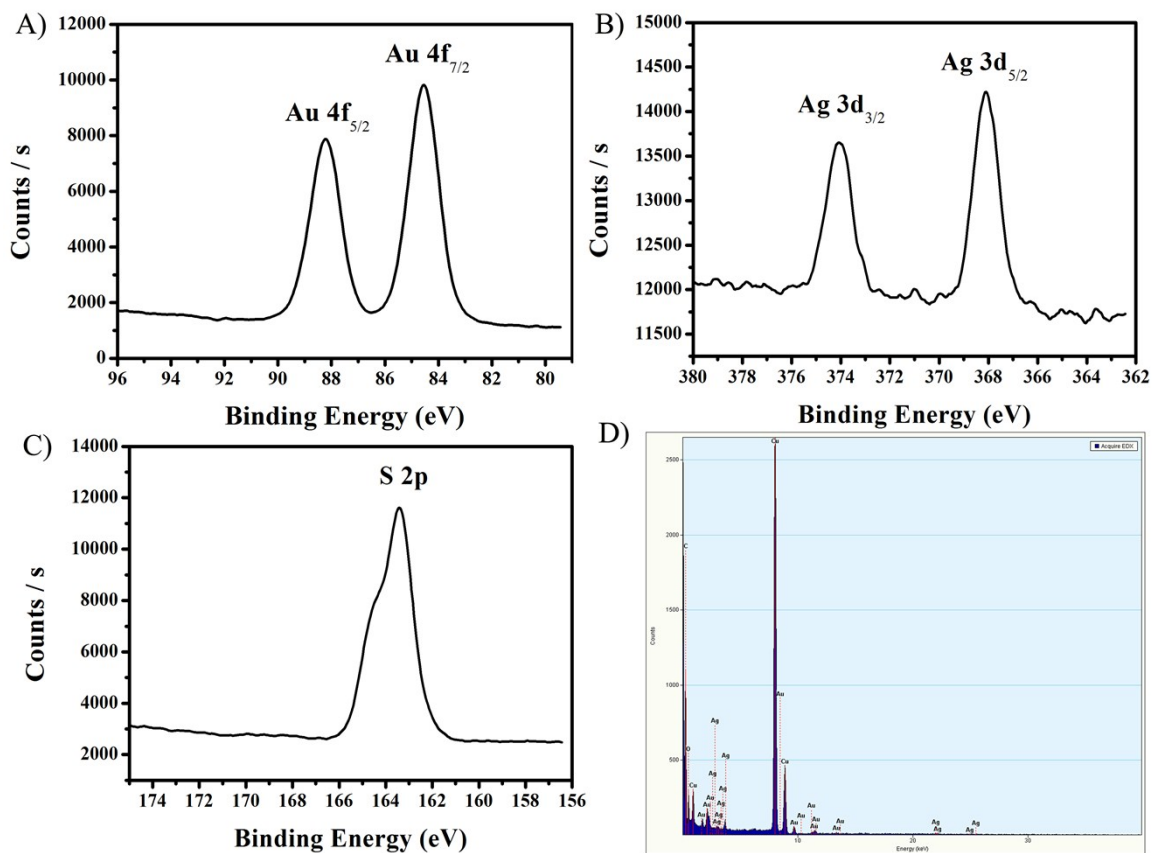
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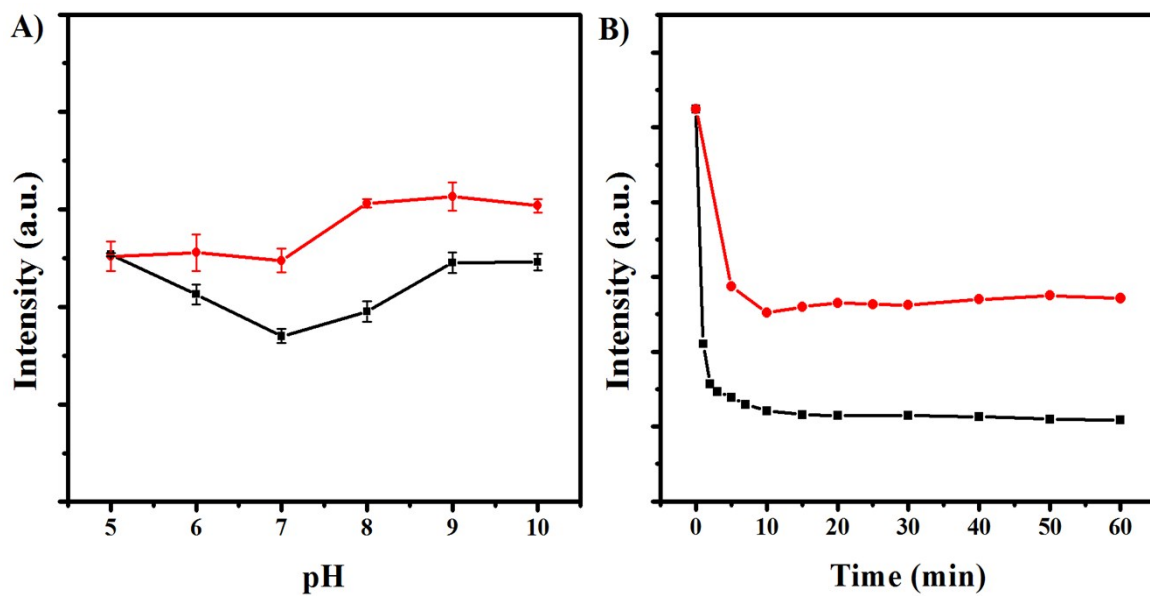
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**Fig. S1** (A) UV-vis absorption (black) and fluorescence emission (red) spectra of AuAgNCs. The inset shows the photographs of AuAgNCs under the visible (left) and ultraviolet light (right). (B) Emission spectra of AuAgNCs at different excitation wavelengths from 315 nm to 370 nm. The break section of each line is the frequency-doubled peak of the corresponding excitation wavelength. (C) TEM image of the AuAgNCs. (D) Size distribution histogram of the AuAgNCs in diameter.



**Fig. S2** XPS spectra of Au 4f (A), Ag 3d (B) and S 2p (C) for AuAgNCs. (D) EDX spectrum of AuAgNCs.



**Fig. S3** The effect of pH (A) and incubation time (B) on fluorescence intensity of AuAgNCs in the experiment of detecting Cr(III) (black: Cr(III), 20  $\mu$ M) and Cr(VI) (red: Cr(VI), 20  $\mu$ M; AA, 100  $\mu$ M; pH 7.0).

**Table S1.** Recovery of chromium in lake water samples before and after (\*) pretreated by ascorbic acid (n = 3)

Added Cr(III)/Cr(VI) ( $\mu\text{M}$ )	Found chromium ( $\mu\text{M}$ )	Recovery (%)	RSD (%)
1.25/0	1.21	96.8	6.5
1.25/1.25	1.23	98.4	8.8
1.25/1.25*	2.51	100	4.1
2.5/0	2.49	99.6	3.9
2.5/1.25	2.48	99.2	5.4
2.5/1.25*	3.76	100	7.4
2.5/0	2.49	99.6	4.5
2.5/2.5	2.47	98.8	5.1
2.5/2.5*	4.95	99.0	6.3

Recovery % = (found / added)  $\times$  100%