

# Supporting information

## Facile Fabrication of Au/Cu Bimetallic Nanoclusters Based Fluorescent Composite Film for Sensitive and Selective Detection of Cr(VI)

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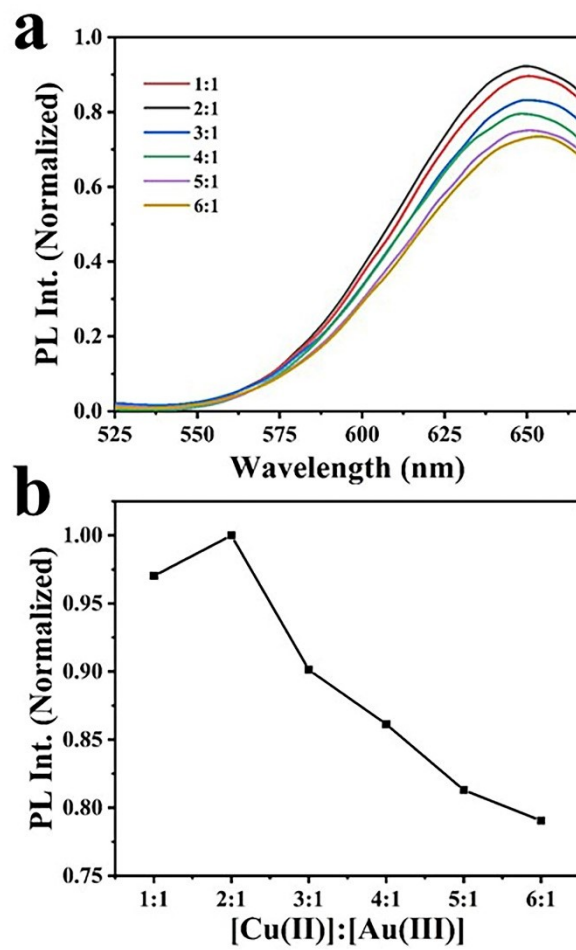
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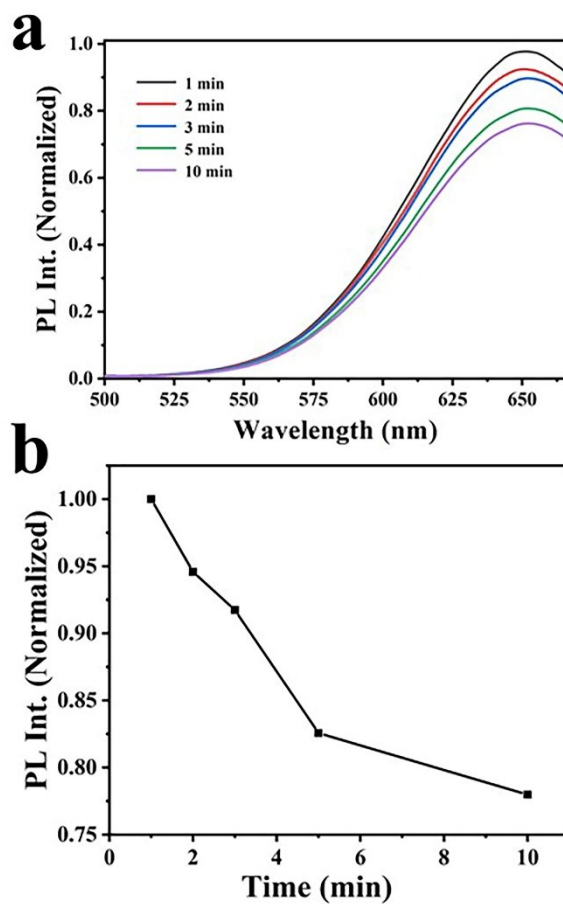
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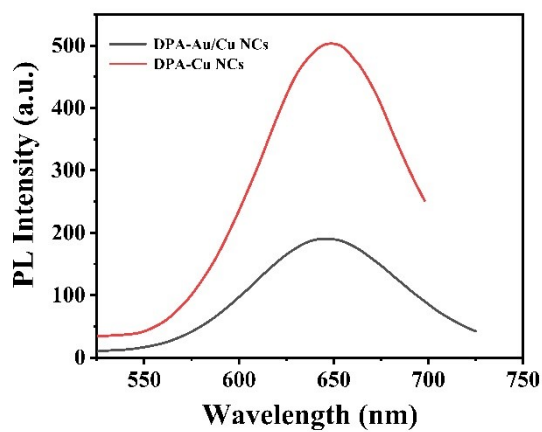
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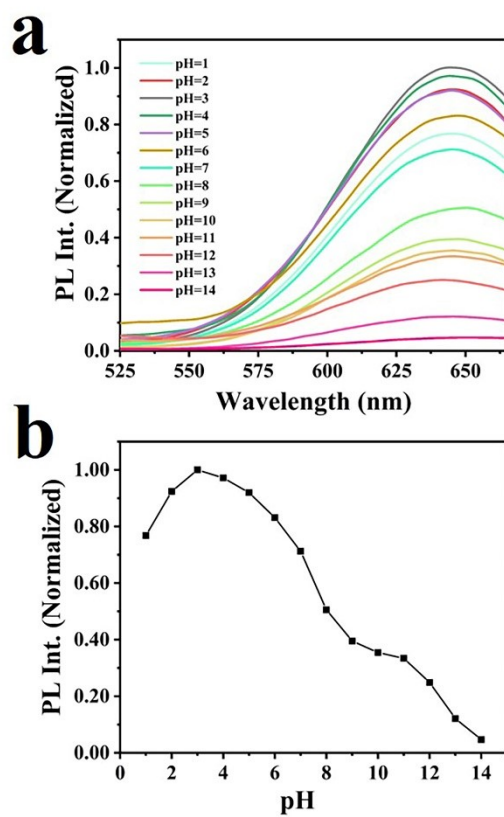
**Fig. S1.** (a) fluorescence spectra and (b) relative fluorescence intensity line graphs of DPA-Au/Cu NCs with different [Cu(II)]: [Au(III)] amount of substance ratios.



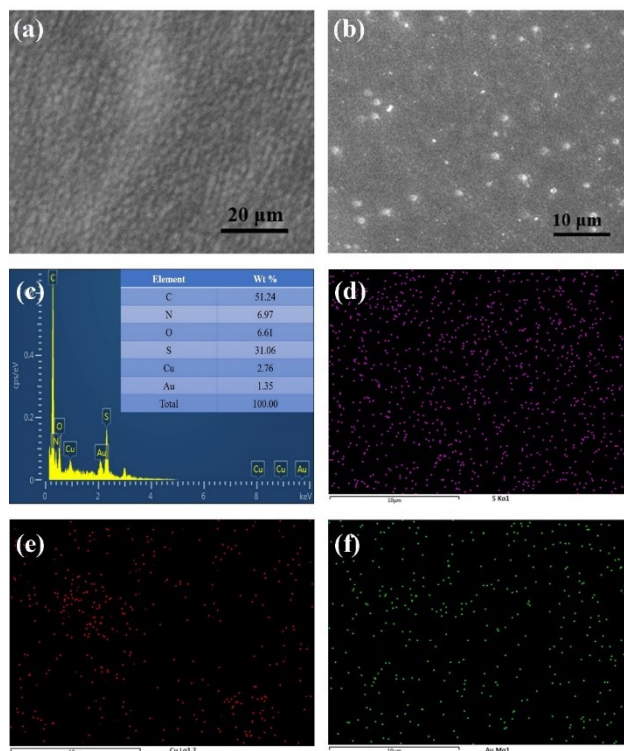
**Fig. S2.** (a) fluorescence spectra and (b) relative fluorescence intensity line graphs of DPA-Au/Cu NCs under different reaction time conditions.



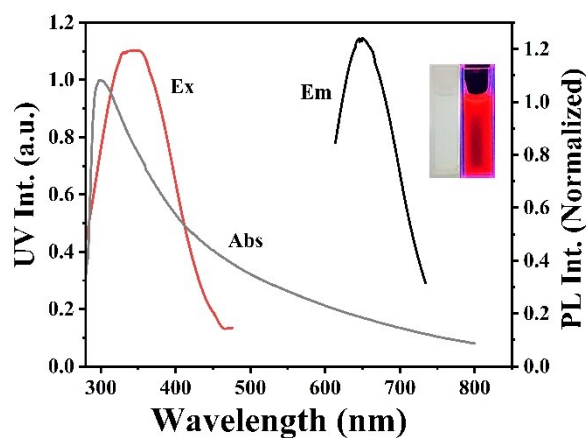
**Fig. S3.** Fluorescence spectra of DPA-Cu NCs and DPA-Au/Cu NCs.



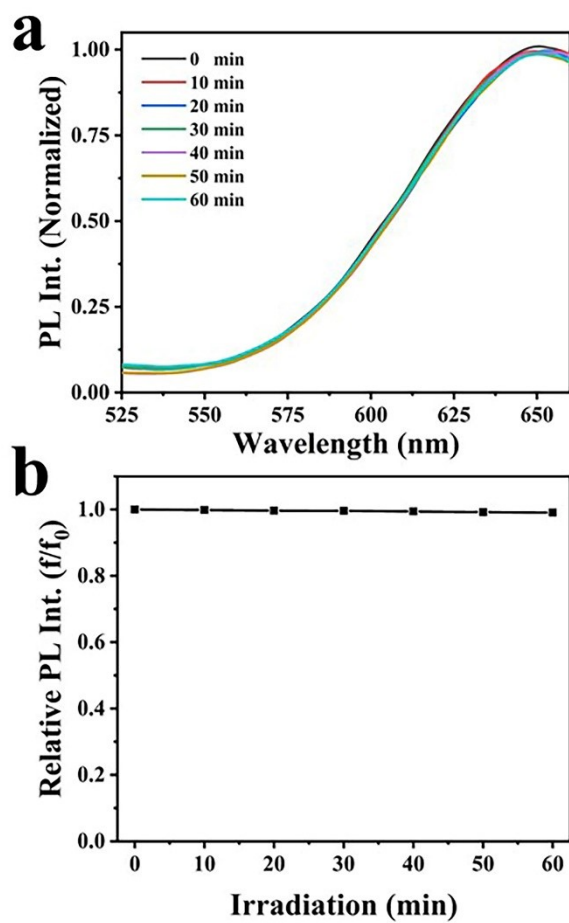
**Fig. S4.** (a) fluorescence spectra and (b) relative fluorescence intensity line graphs of DPA-Au/Cu NCs under different pH values.



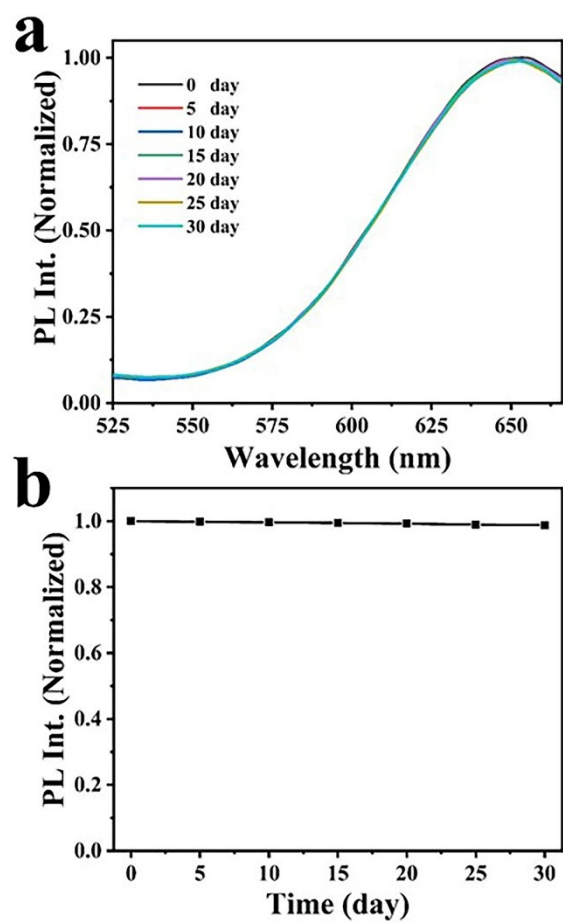
**Fig. S5.** (a) SEM image of CS film. (b) SEM image of DPA-Au/Cu NCs@CS fluorescent composite film. (c) EDS diagram of DPA-Au/Cu NCs@CS fluorescent composite film. (d-f) Elemental mapping of S, Cu, Au for DPA-Au/Cu NCs@CS fluorescent composite film.



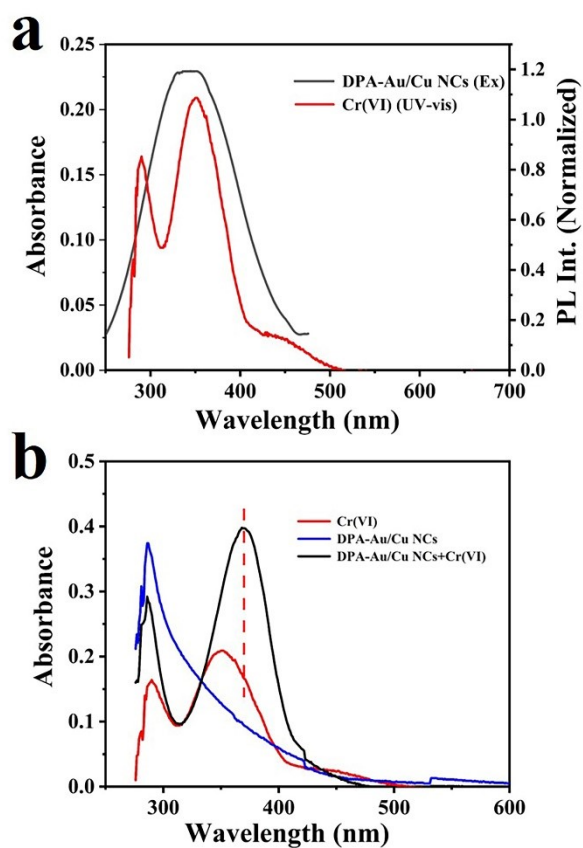
**Fig. S6.** Fluorescence excitation (Ex) and emission (Em) spectra of DPA-Au/Cu NCs plotted with UV absorption spectra (Abs); insets show the images of DPA-Au/Cu NCs in visible light (left) and under 365 nm UV light irradiation (right).



**Fig. S7.** DPA-Au/Cu NCs@CS at different times of UV lamp ( $\lambda=365$  nm) irradiation to (a) fluorescence emission spectra and (b) linear plots of relative fluorescence intensity.



**Fig. S8.** DPA-Au/Cu NCs@CS placed at room temperature for different days corresponding to (a) fluorescence emission spectra and (b) linear plots of relative fluorescence intensity.



**Fig. S9.** (a) UV-vis absorption spectra of the Cr(VI) and fluorescence excitation spectra of the DPA-Au/Cu NCs; (b) UV-vis absorption spectra of the DPA-Au/Cu NCs, Cr(VI), and DPA-Au/Cu NCs with Cr(VI).



**Table S1. Sensing performance of different nanocluster fluorescent sensors for the detection of Cr(VI)**

Nanoclusters sensors	Detection limits	Optimal emission wavelength	References
Au NCs	7.2 ppb	480 nm	1
CA-Au/Cu NCs	23.53 ppb	436 nm	2
Cu NCs	0.03 mM	411 nm	3
Cu NCs	43 nM	490 nm	4
BSA-Ag NCs	2.32 nM	707 nm	5
Ir NCs	7.35 ppb	575 nm	6
BSA-Au NCs	0.6 nM	615 nm	7
Au/Ag NCs	0.3 $\mu$ M	610 nm	8
GSA-Au NCs	35.30 ppb	600 nm	9
PEI-Ag NCs	1.1 $\mu$ M	472 nm	10
DPA-Au/Cu	0.26 ppb	647 nm	This study

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