



## Supplementary Materials

# Cation Crosslinking-Induced Stable Copper Nanoclusters Powder as Latent Fingerprints Marker

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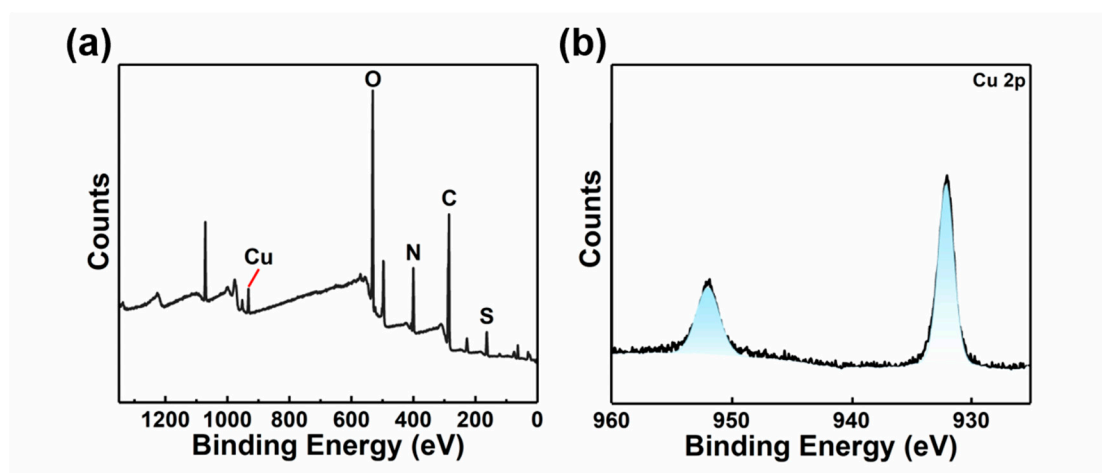


Figure S1. (a) XPS survey of GSH-Cu NCs; (b) XPS spectrum of Cu 2p electrons in GSH-Cu NCs.

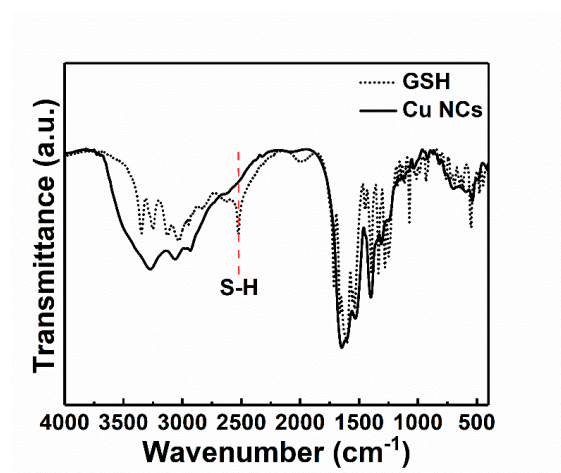
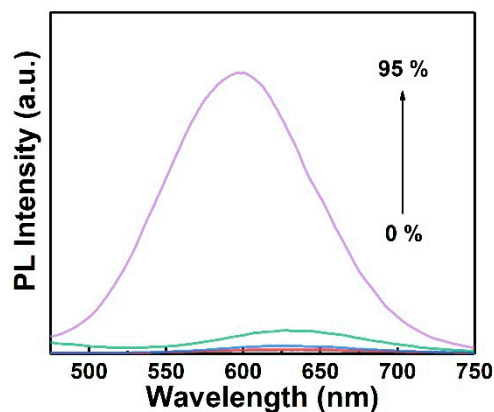
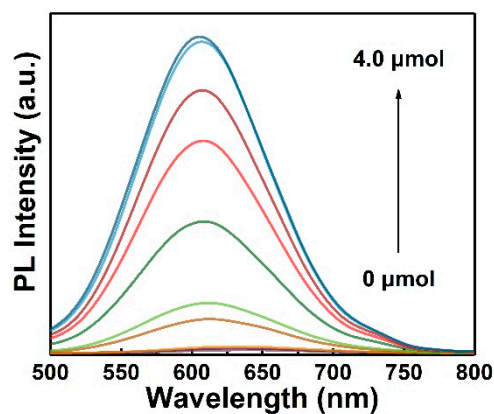


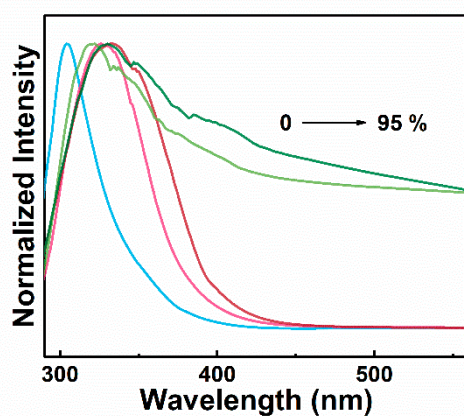
Figure S2. FTIR spectrum of GSH and Cu NCs.



**Figure S3.** Emission spectrum of Cu NCs with different concentration of IPA (from 0 to 95 %) under the excitation of 365 nm.



**Figure S4.** Emission spectrum of Cu NCs with different amount of Ce<sup>3+</sup> (from 0 to 4.0 μmol) under the excitation of 365 nm.



**Figure S5.** Absorption spectrum of Cu NCs with different concentration of IPA (from 0 to 95 %).

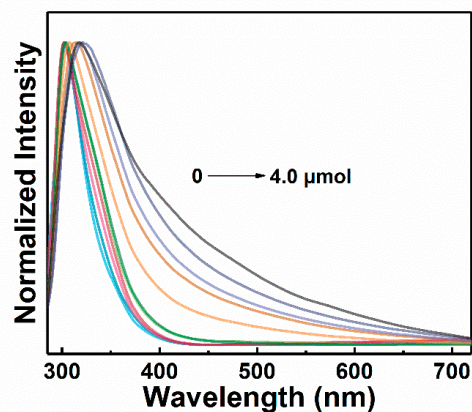


Figure S6. Absorption spectrum of Cu NCs with different amount of  $\text{Ce}^{3+}$  (from 0 to 4.0  $\mu\text{mol}$ ).

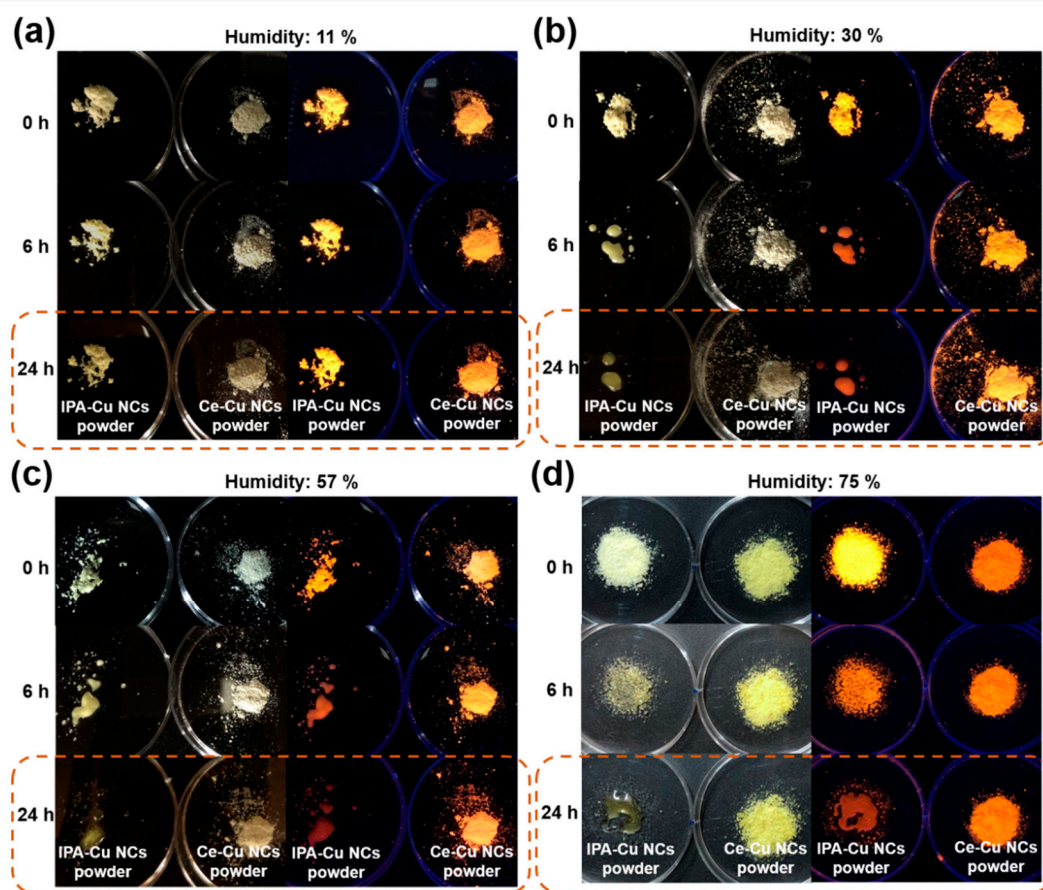


Figure S7. Photographs of IPA-Cu NCs powder and Ce-Cu NCs powder after different time (0, 6 and 24 h) in the same store condition (temperature of 25 °C) under daylight and under UV light under different ambient humidity: (a) 11 %, (b) 30 %, (c) 57 % and (d) 75 %.

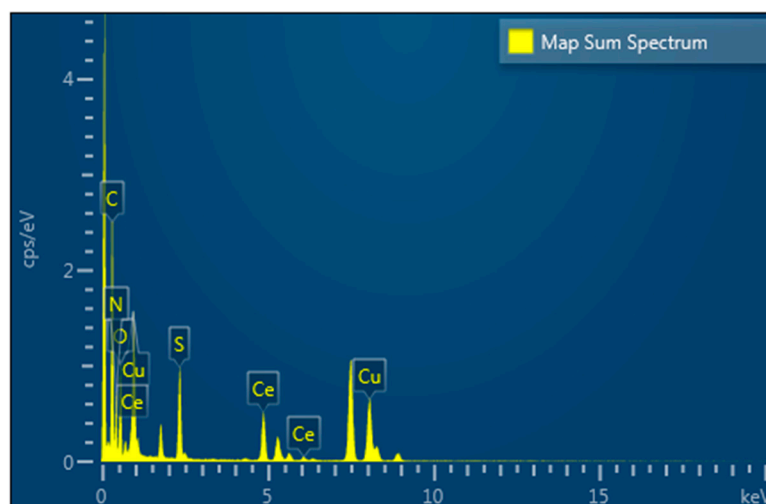


Figure S8. Map sum spectrum of Ce-Cu NCs aggregates.

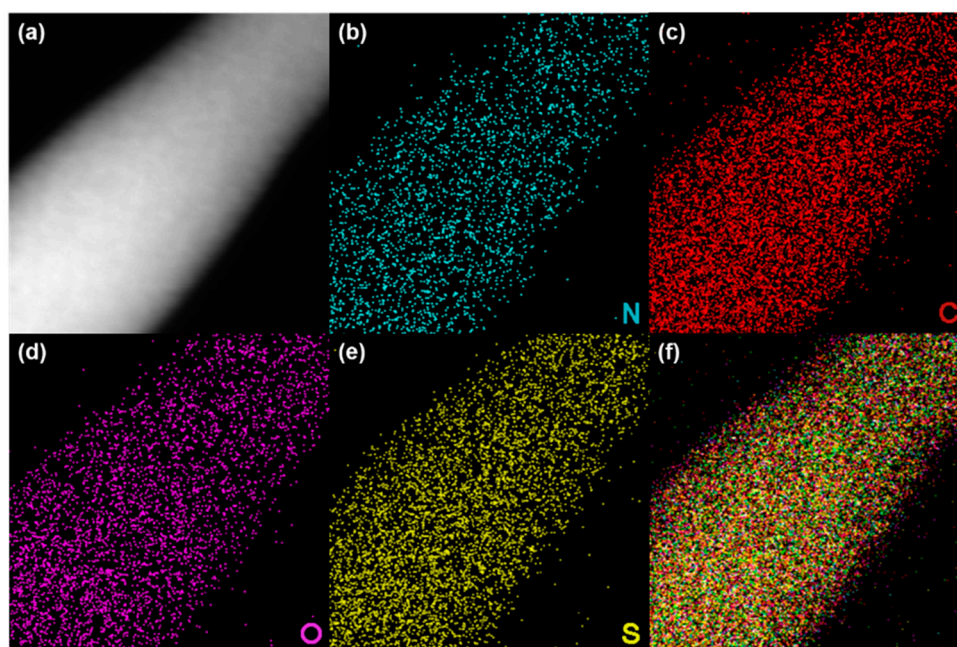


Figure S9. (a) HAADF-STEM image of Ce-Cu NCs aggregates; EDS elemental mapping of (b) C, (c) N, (d) O, (e) S and (f) overlapped EDS images of Ce-Cu NCs aggregates.

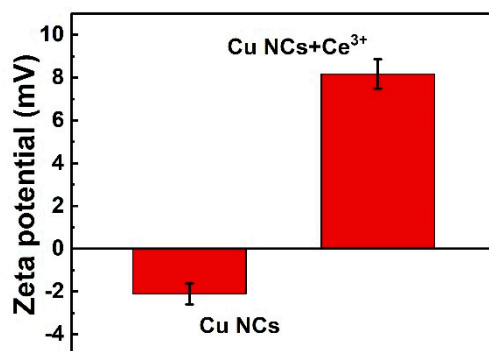
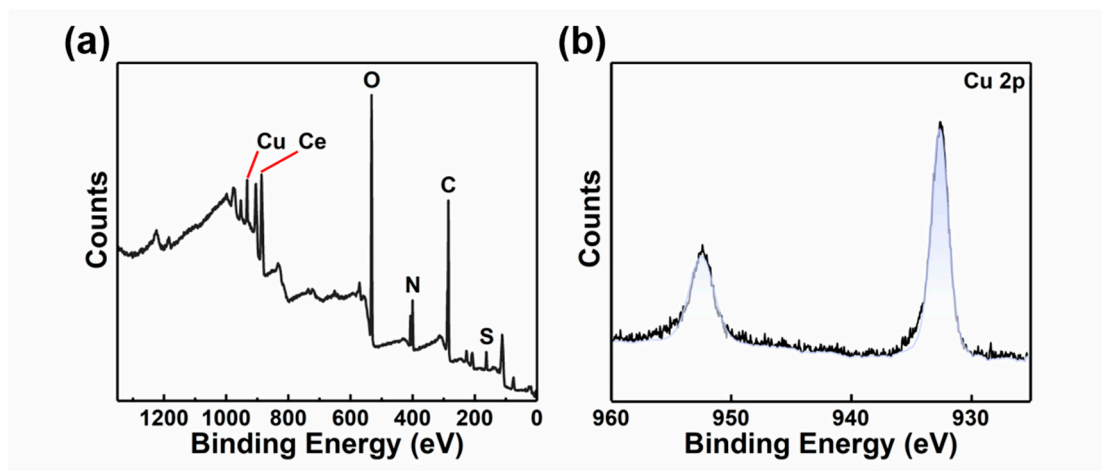
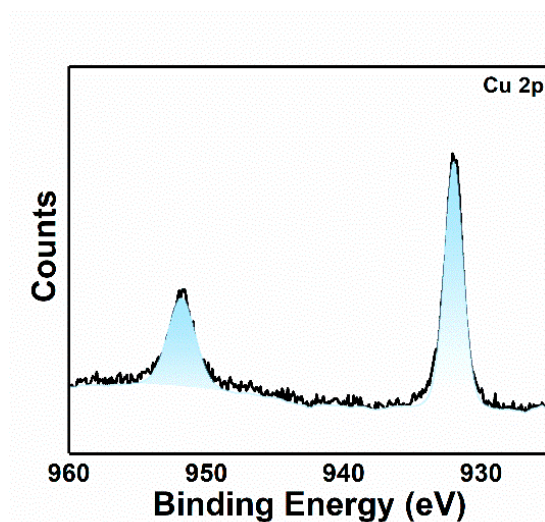


Figure S10. Zeta potential of Cu NCs and Ce-Cu NCs aggregates.

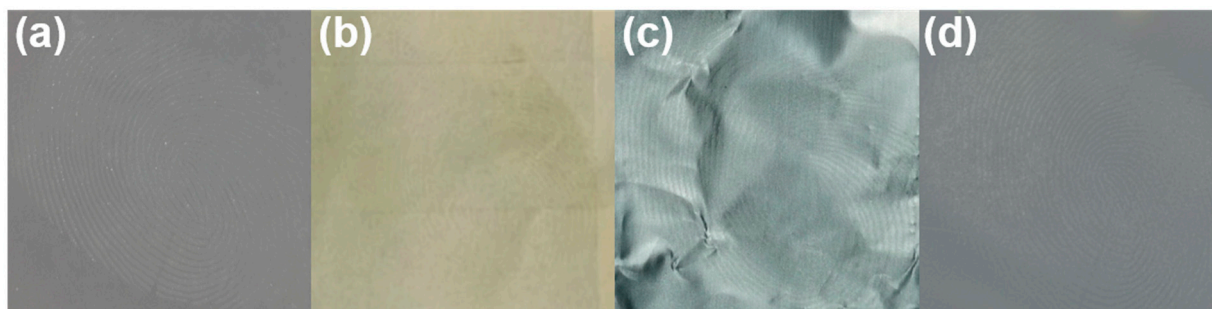




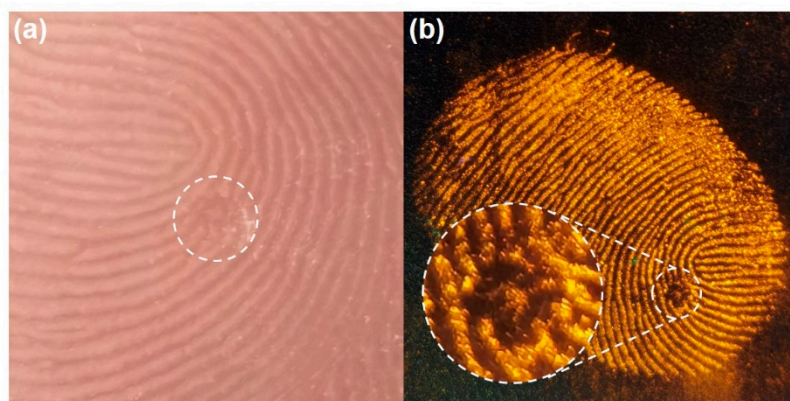
**Figure S11.** (a) XPS survey of Ce-Cu NCs aggregates; (b) XPS spectrum of Cu 2p electrons in Ce-Cu NCs aggregates.



**Figure S12.** XPS spectrum of Cu 2p electrons in Ce-Cu NCs aggregates stored for 3 days.



**Figure S13.** Photos under daylight of latent fingerprints on (a) glass, (b) paper, (c) foil, and (d) plastic.



**Figure S14.** (a) Photo of finger of the donor under daylight; (b) photo of latent fingerprints detection using Ce-Cu NCs powder under UV light. Inset in (b) showed the scar of the donor's finger.