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Supplementary Material:

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**Green-Emitting Fluorescence Ag Clusters:
Facile Synthesis and Sensors in Hg²⁺ Detection**

Chang Zhang^{*,a,b}, Zhi Guo^{a,b}, Guiqiu Chen,^{*,a,b} Guangming Zeng^{a,b}, Ming Yan^{a,b},

Qiuya Niu^{a,b}, Lingzhi Liu^{a,b}, Yanan Zuo^{a,b}, Zhenzhen Huang^{a,b}, Qiong Tan^{a,b}

^a College of Environmental Science and Engineering, Hunan University, Changsha 410082, P.R. China.

^b Key Laboratory of Environmental Biology and Pollution Control (Hunan University), Ministry of Education, Changsha 410082, P.R. China.

*Corresponding Author. Phone: +86 731 88822829. Fax: +86 731 88823701. E-mail: zhangchang@hnu.edu.cn (C.Z.), gqchen@hnu.edu.cn (G.C.).

ARTICLE

EXPERIMENTAL SECTION

Synthesis and Characterization of Citrate-Stabilized AgNPs. Citrate-stabilized AgNPs were synthesized according to the method described by Liu et al.¹ with little modification. A 59.2 ml solution containing 0.6 mM trisodium citrate and 0.4 mM NaBH₄ was prepared in Milli-Q water (MQ) and stirred vigorously in an ice bath. The solution turned yellow upon the addition of 0.5 ml of 24.0 mM AgNO₃, indicating the formation of the AgNPs. After 3 h of additional stirring at room temperature, the soluble byproducts were removed by centrifugal ultrafiltration (molecular weight cutoff of 8000), and the AgNPs were washed with MQ water.

The AgNPs were characterized under the experimental conditions used for the Ag clusters and in nanopure water suspensions or powders (Figures S1A and S1B).

Reference

1. J. G. Zhang, S. Q. Xu, and E. Kumacheva, *Adv. Mater.*, 2005, **17**, 2336–2340.

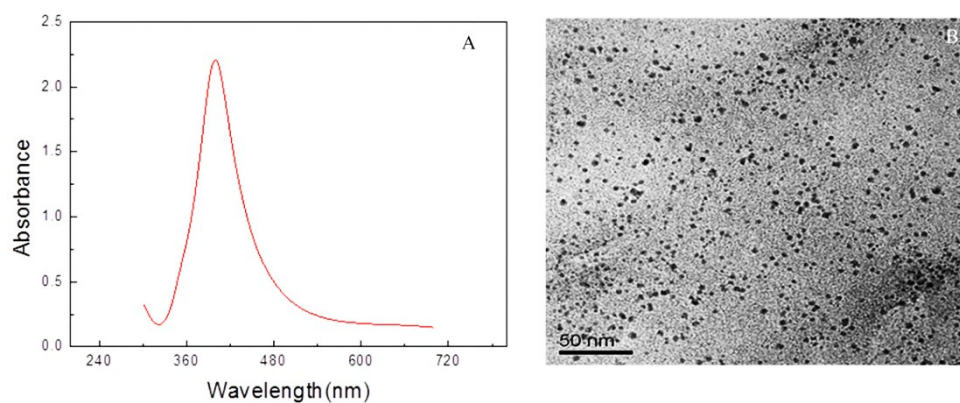


Figure S1. (A) UV-vis absorption spectra of Citrate-AgNPs suspended in Milli-Q water and (B) TEM image of Citrate-AgNPs.

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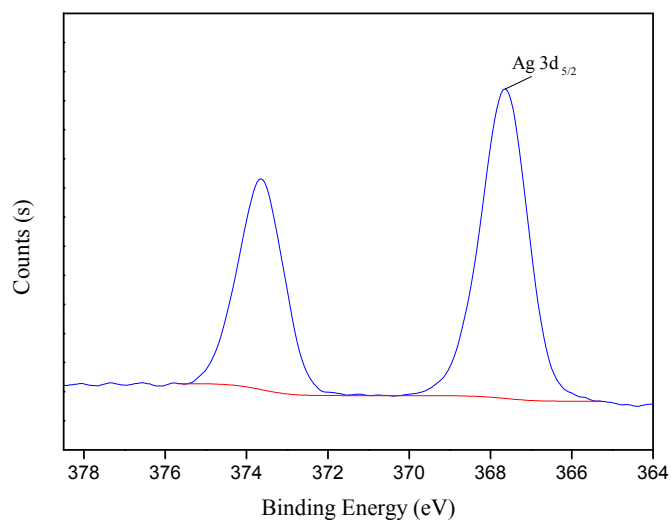


Figure S2. XPS spectra of the Ag clusters. The initial pH was 12.08.



Figure S3. Photographs of various Ag clusters solutions prepared by controlling the pH. The pH (from left to right) was 6.0 (the control), 11.74, 12.08, and 12.75.

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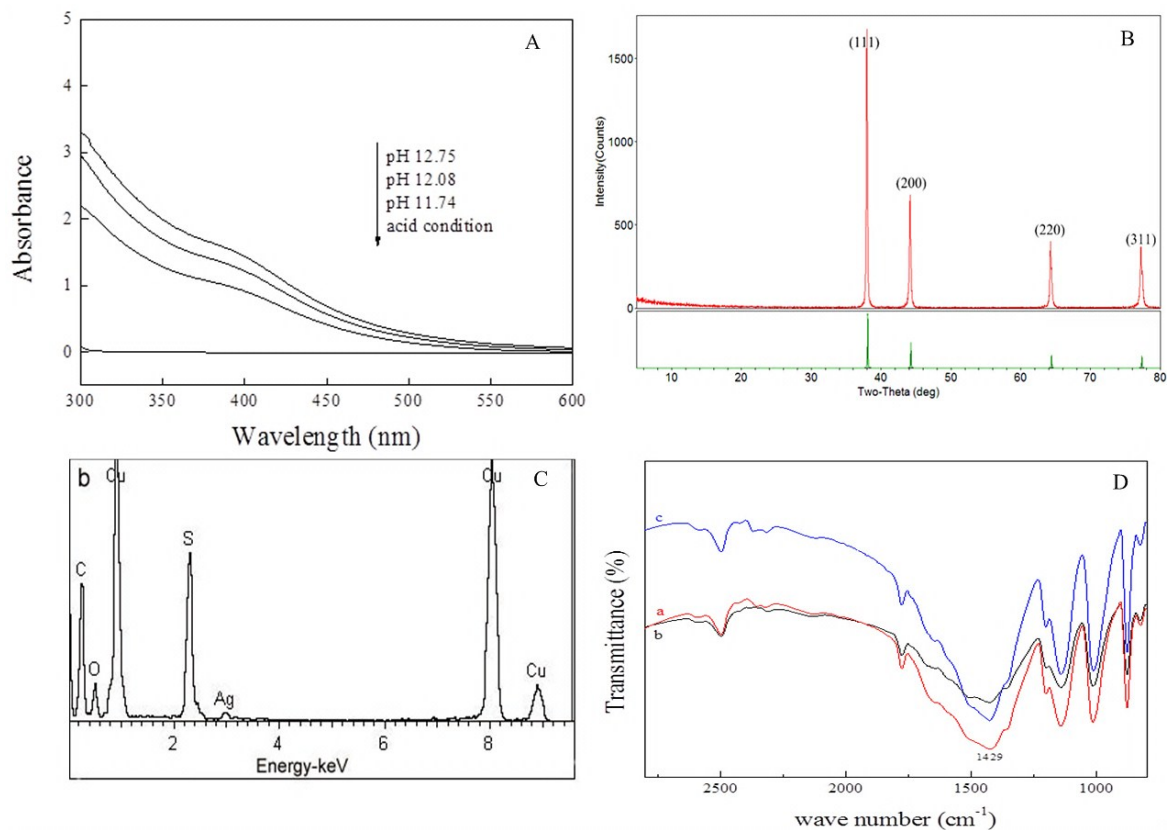


Figure S4. (A) UV-vis absorption spectra of the solutions illustrating the effect of pH. The pH under acid conditions (black line) was 6.0. (B) XRD pattern of dried Ag clusters materials. (C) EDS data of fluorescent AgNCs. (D) FT-IR spectra obtained from samples after (a, blank) 2 h, (b, red) 4 h and (c, blue) 12 h culture.

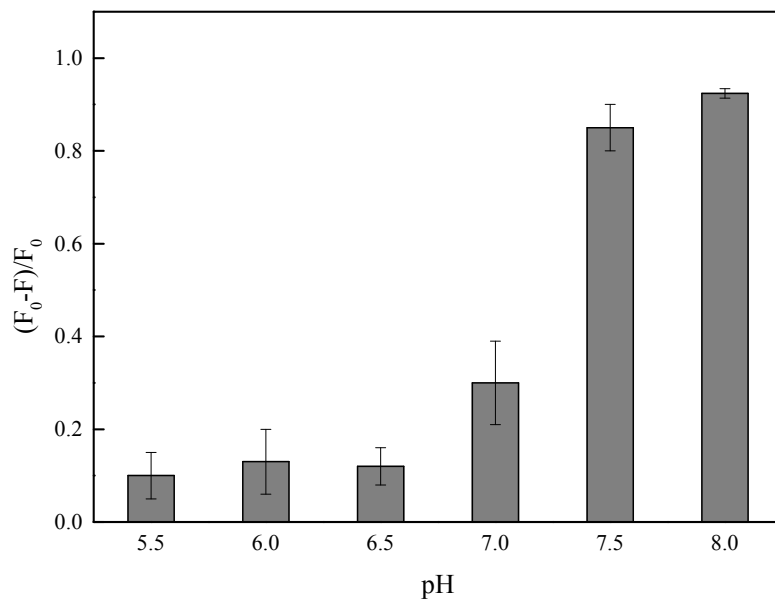


Figure S5. Effect of pH on the fluorescence quenching. Hg^{2+} concentration was 10000.0 nM and the fluorescence intensity was recorded at 548 nm.

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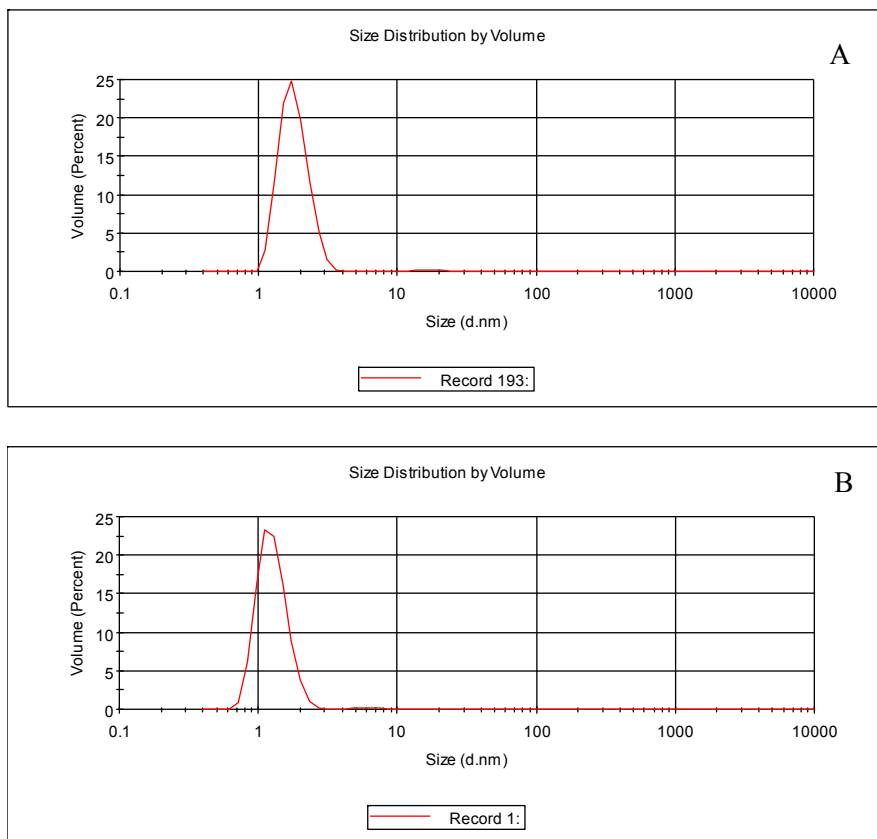


Figure S6. DLS size distribution of (A) BSA-Ag cluster (28.0 nm) and (B) Citrate-AgNPs (25.6 nm).

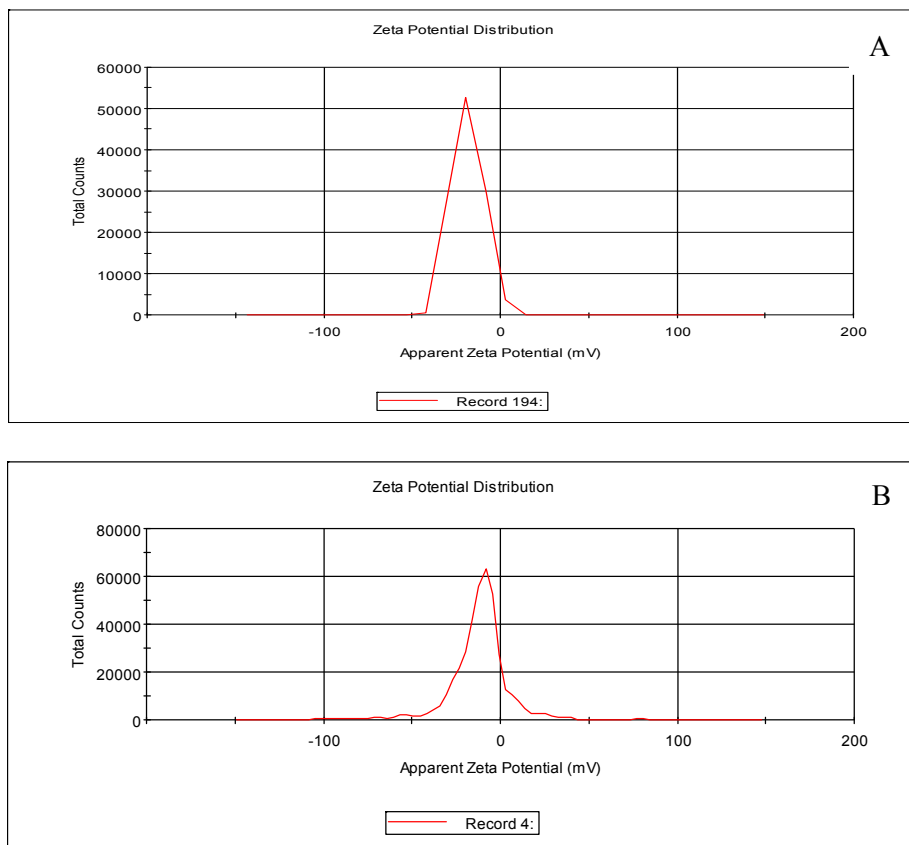


Figure S7. DLS zeta potential distribution of (A) BSA-Ag cluster (-18.1 mV) and (B) Citrate-AgNPs (-12.4 mV).