

## Electronic Supplementary Information

# Highly Fluorescent Ag Nanoclusters: Microwave-Assisted Green Synthesis and Cr<sup>3+</sup> Sensing

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Experimental section

### Materials

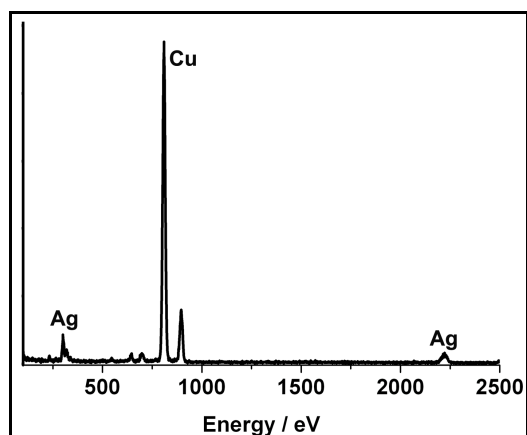
Polymethacrylic acid sodium salt (PMAA-Na, Mw 4000-6000, 40 wt.% solution in water) was from Sigma-Aldrich. Silver nitrate (AgNO<sub>3</sub>, 99.98%) and other metal salts were obtained from Nanjing Chemical Co. (China). All reagents were of analytical reagent grade and used as received. Doubly deionized water (18.2 MΩ\*cm at 25 °C) prepared on a Milli-Q (MQ) water system was used throughout all experiments.

### Preparation of highly fluorescent Ag nanoclusters

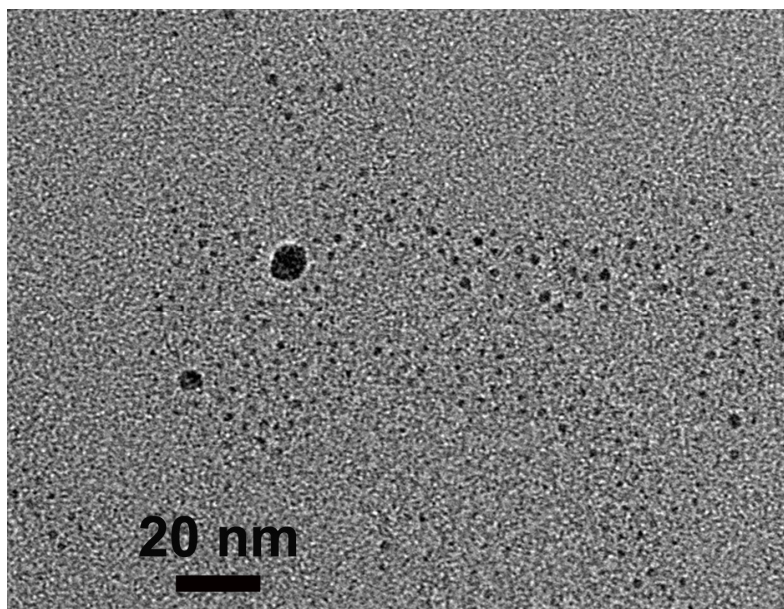
In a typical synthesis, 0.5 mL of PMAA-Na solution (40 %) were added to freshly prepared 10 mL of 50 mM AgNO<sub>3</sub> aqueous solution. The mixture was stirred vigorously to acquire a transparent homogeneous solution and then transferred to the reaction tube and placed inside the cavity of CEM Instruments (CEM Discover synthesis system, USA). Under microwave irradiation (200 W), the reaction was stopped within 70 seconds. In addition, the pH of the mixing dispersion was adjusted to the required value by adding HNO<sub>3</sub> or NaOH and the initial Ag<sup>+</sup> ion concentrations were varied to investigate the influence on the fluorescence properties of Ag nanoclusters.

## Characterization

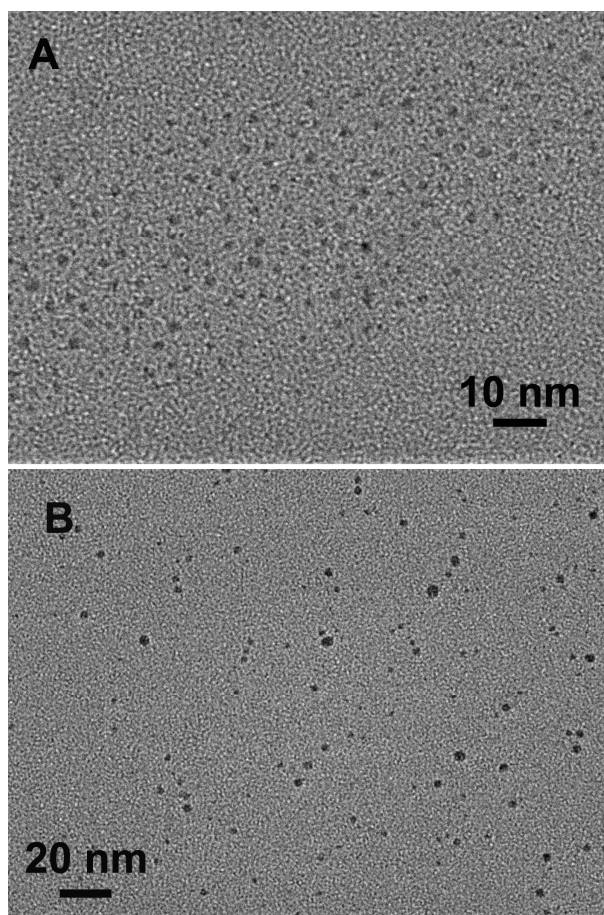
No post-preparative treatment was performed on any samples for optical characterization. UV-Vis absorption spectra were obtained using a UV-3600 spectrophotometer (Shimadzu). Fluorescence measurements were performed using a Bruker RF-5301PC fluorescence spectrometer. The quantum yield (QY) of fluorescent Ag nanoclusters prepared in a typical procedure was measured using Rhodamine 6G as a reference standard (QY: 95 % in ethanol). All optical spectra were examined under room temperature. High resolution transmission electron microscopy (HRTEM) images and energy dispersive X-ray (EDX) spectra were taken using a JEM-2100 with an accelerating voltage of 200 kV, equipped with an energy dispersive X-ray spectroscopy.



**Fig. S1** The EDX spectra of the fluorescent Ag nanoclusters.



**Fig. S2** TEM image of Ag nanoclusters obtained by using conventional heating instead of microwave irradiation.



**Fig. S3** TEM image of fluorescent Ag nanoclusters obtained with different initial concentration of  $\text{Ag}^+$  ions. 25 mM (A), and 100 mM (B).