

Electronic Supplementary Information

Interfacial Synthesis of Luminescent 7kDa Silver Clusters

K. V. Mrudula, T. Udaya Bhaskara Rao and T. Pradeep*

*DST Unit on Nanoscience, Department of Chemistry and Sophisticated Analytical Instrument
Facility, Indian Institute of Technology Madras, Chennai 600 036, India*

Corresponding author. Fax: + 91-44 2257-0545. E-mail: pradeep@iitm.ac.in

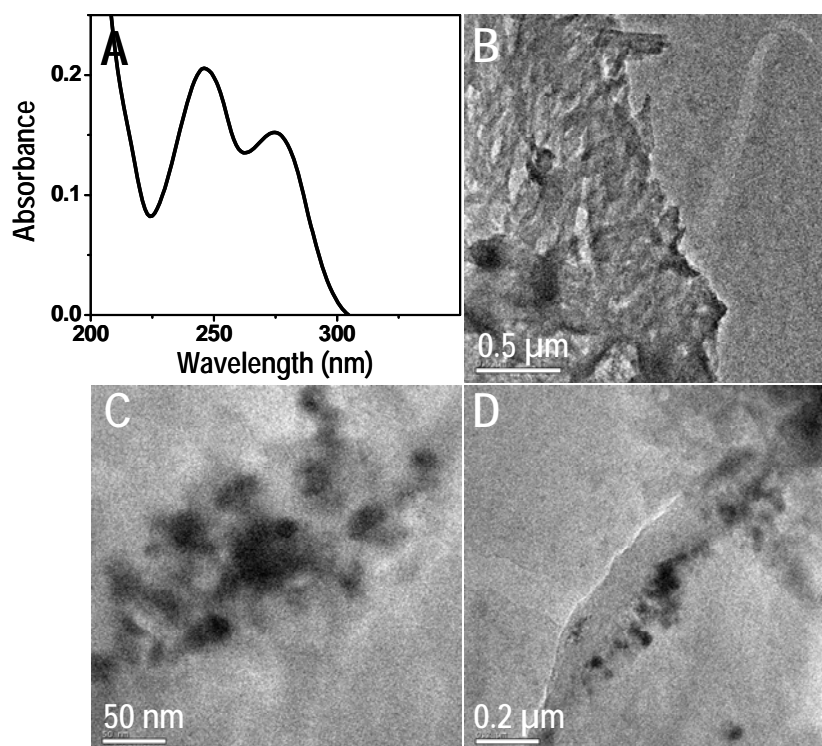


Figure S1. A) Absorption spectrum of guanine sulphate. B, C and D are TEM images of the precipitate obtained after interfacial etching of Ag@MSA with guanine sulphate at 1:4 ratio around 0 °C. The images are unclear and suggest the presence of a thick organic matrix.

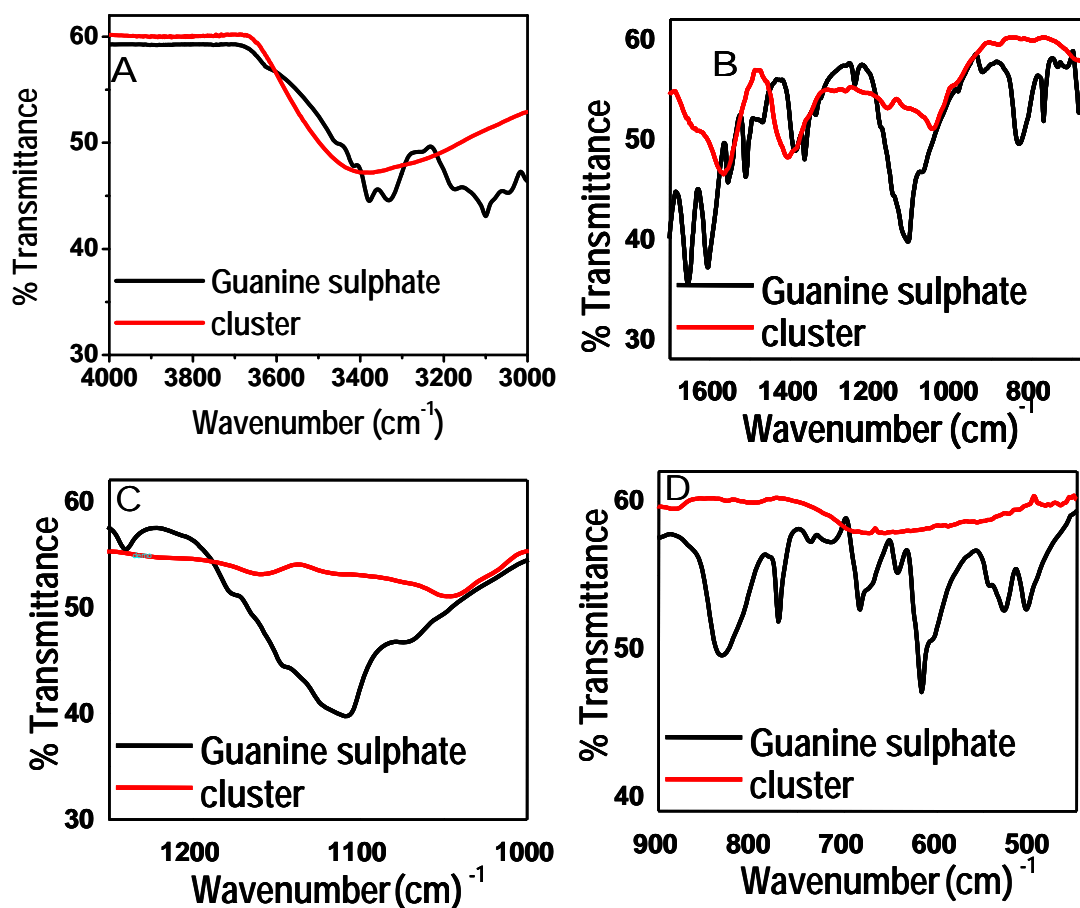


Figure S2. Expanded FT-IR spectra of Ag cluster and guanine sulphate in the A) 3000-4000 cm⁻¹, B) 660-1700 cm⁻¹, C) 1000-1250 cm⁻¹ and D) 450-900 cm⁻¹ regions. The spectrum of the cluster in A and B has been expanded in y axis to show the features.

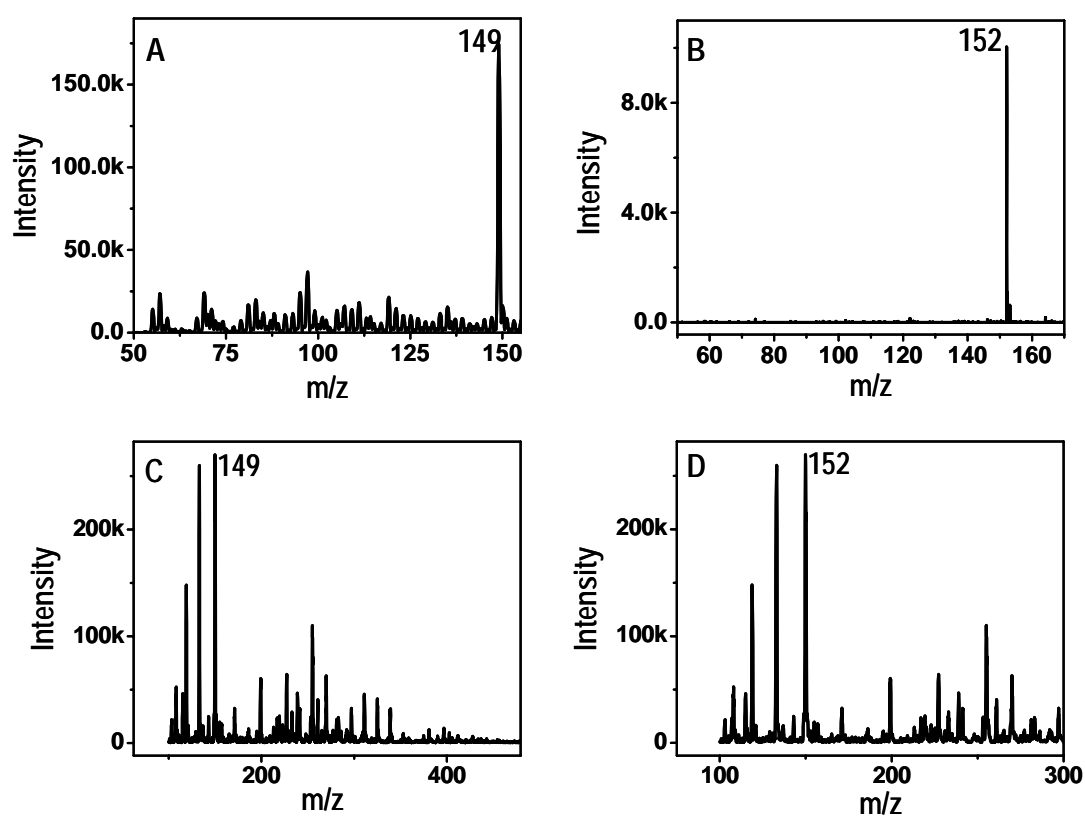


Figure S3. ESI MS of A) MSA (negative mode) showing molecular ion peak at m/z 149; B) guanine sulphate (positive mode) showing molecular ion peak at m/z 152; PAGE separated cluster showing C) MSA and D) guanine in negative and positive modes, respectively.

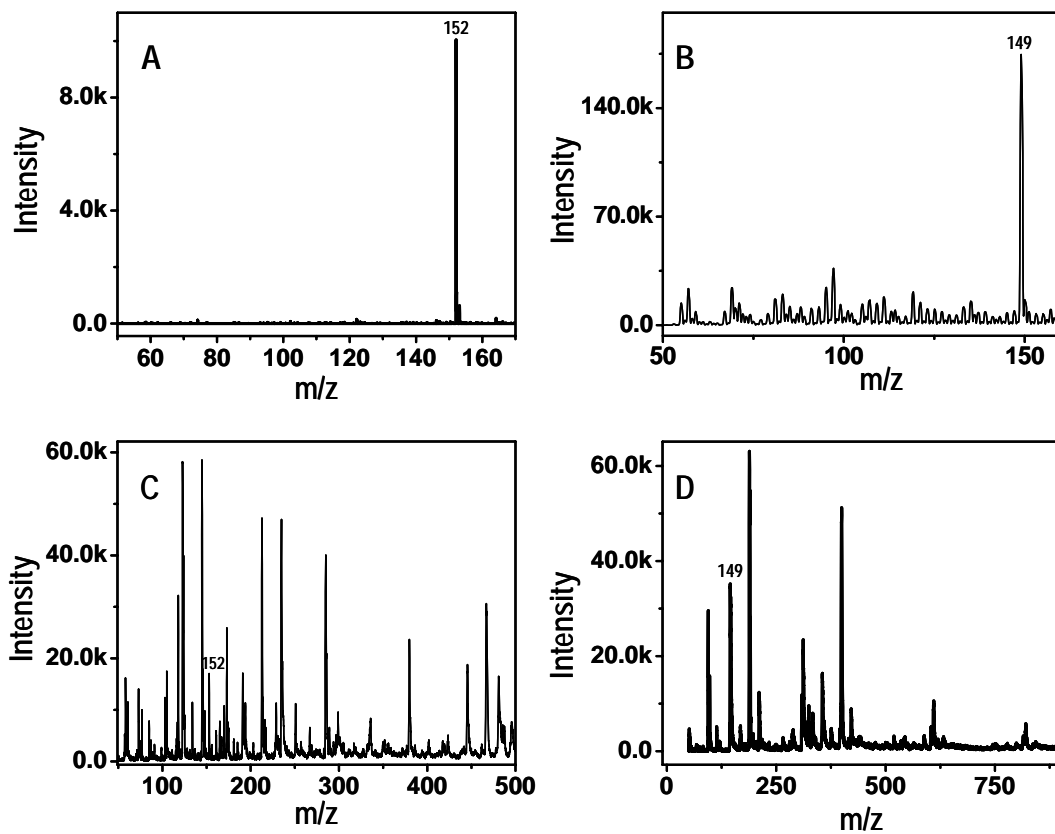


Figure S4. LDI-MS of A) guanine sulphate in positive mode showing molecular ion peak at m/z 152, B) MSA in negative mode showing molecular ion peak at m/z 149, PAGE separated cluster in C) positive and D) negative modes, showing guanine and MSA features, respectively.

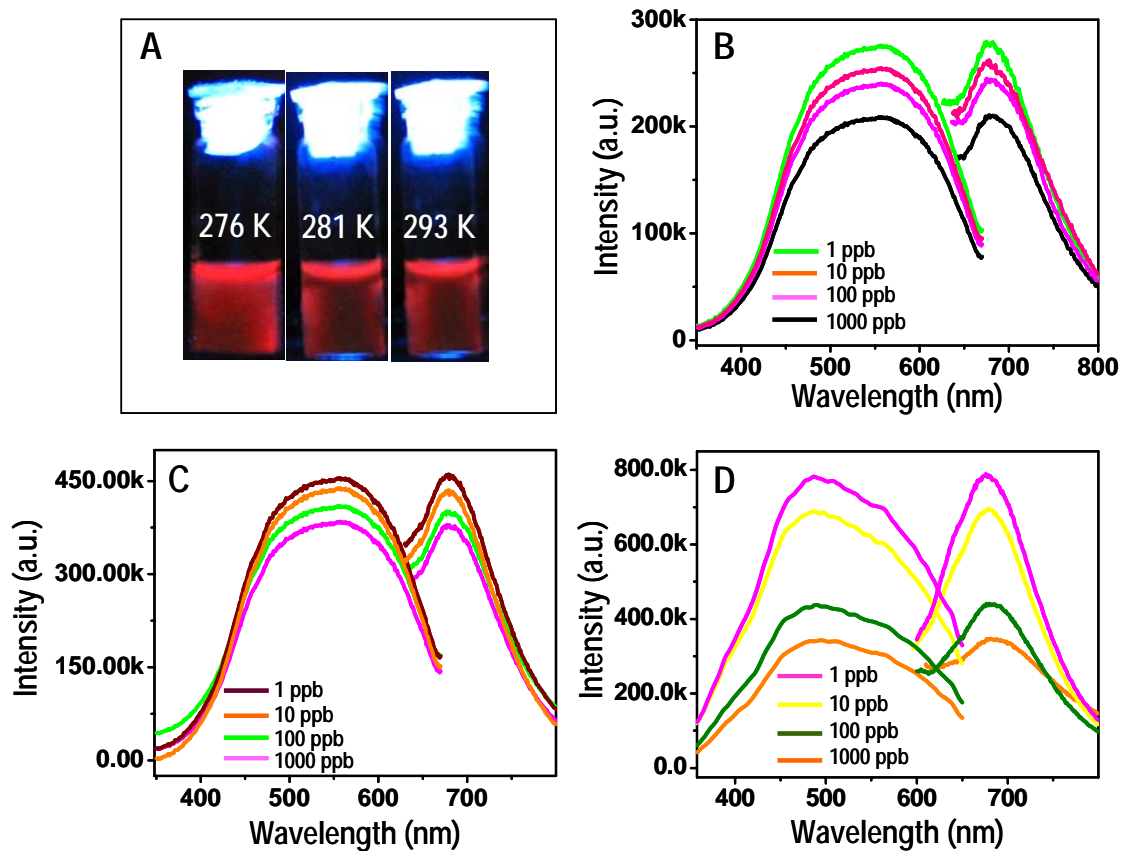


Figure S5. A) Photographs of cluster under UV light at different temperatures. Fluorescence spectra after the addition of B) Mg^{2+} , C) Ni^{2+} and D) Hg^{2+} to cluster solutions.

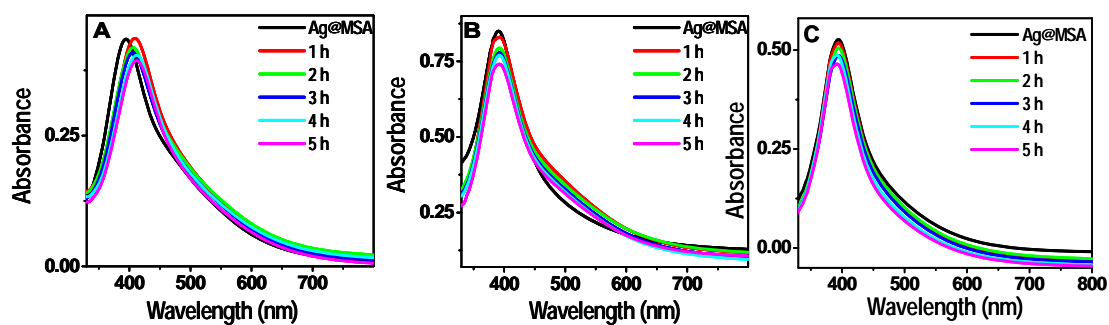


Figure S6. Time dependant absorption spectra of interfacial etching reaction of Ag@MSA with A) adenine and B) thymine and C) cytosine.

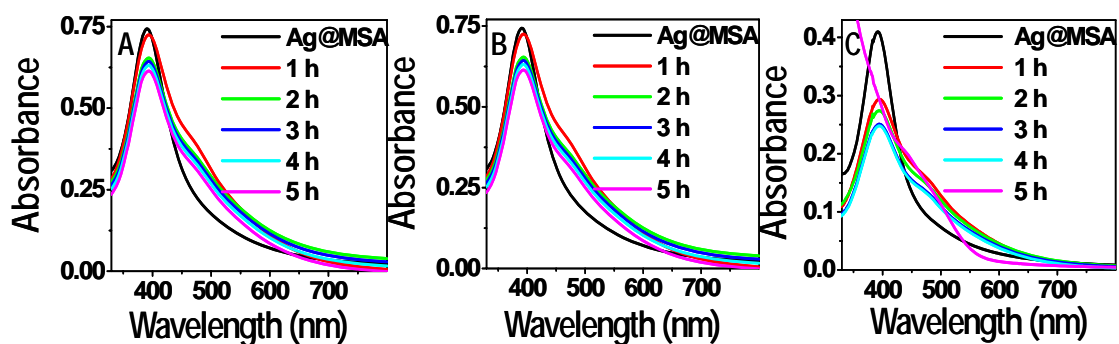


Figure S7. Time dependant optical spectra of etching reactions of Ag@MSA with guanine sulphate with different ratios: A) 1:0.1, B) 1:0.2 and C) 1:1.

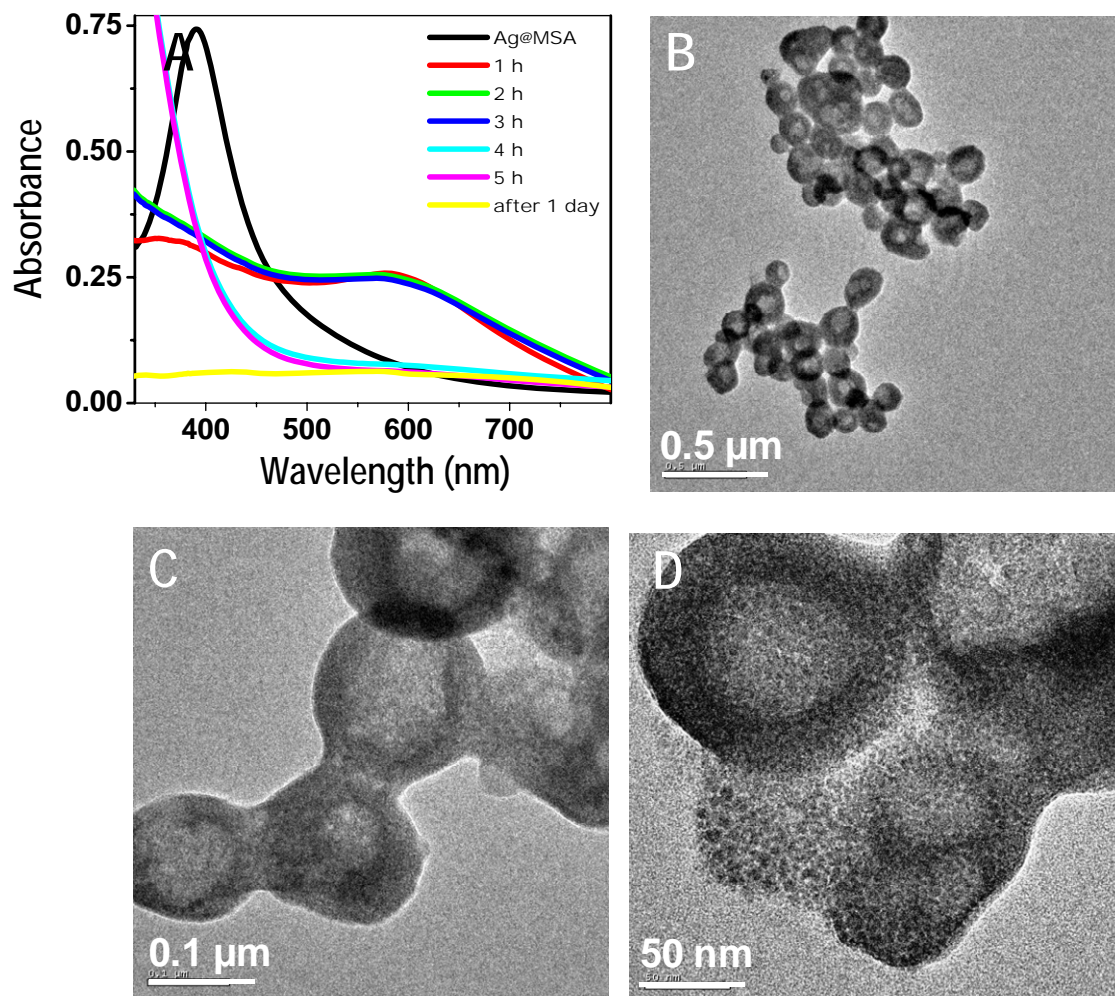


Figure S8. A) Absorption spectra of single phase etching reaction of Ag@MSA with guanine sulphate at 1:4 ratio, conducted at ice-cold conditions. B, C and D are TEM images of the aggregated product in the supernatant at various magnifications. Nanoparticles seem to form spherical hollow aggregates. Isolated nanoparticles are seen in D.