SUPPLEMENTARY INFROMATION FOR PAPER:

Nanoscale Phase Separation in Coated Ag Nanoparticles

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1 - Dynamic Light Scattering of silver NPs.

NPs dimensions were assayed using a Nano ZS90 DLS (Malvern). The pH of the solutions was set at 10 with CAPS (0.01M) , to avoid aggregation of the NPs. Five determinations were made and average sizes and distribution widths were calculated. As could be noted, the hydrodynamic diameter does not significantly change after coating.

Table 1S. NP size and distribution width obtained by DLS.

Capping Agent	**NP average size** (nm) *****	**Distribution width** (nm)
citrate	8 (±1)	1.6 (±0.2)
Cysteine	7 (±1)	1.2 (±0.6)
GSH	8 (±2)	1.7 (±0.4)

*Note: we report between parenthesis the standard deviation of five different determination. Data refers to the hydrodynamic diameter of the NPs.

2 - NPs composition assayed by Scanning Electron Microscopy coupled to Energy Dispersion Spectroscopy

The results show that the amount of capping agent covering the NPs differs from GSH to Cys capped NPs. The amount of sulfur can be related quantitatively to the amount of capping agent present in the samples, since each capping molecule contains one sulfur atom in the structure, and the capping agents are the only source of Sulfur in the synthesis batch. It is to notice that the amount of Cysteine that produce full coating of NPs surface is three times higher than the amount of GSH, probably due to the different steric hindrance of these molecules.

Table 2S. Average composition of capped NPs

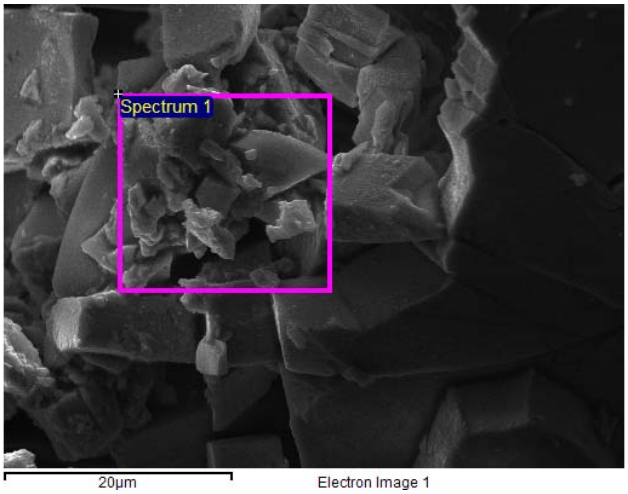
Capping Agent	Sulfur:Silver ratio*
GSH NPs	0.032 ± 0.002
Cysteine NPs	0.111 ± 0.005

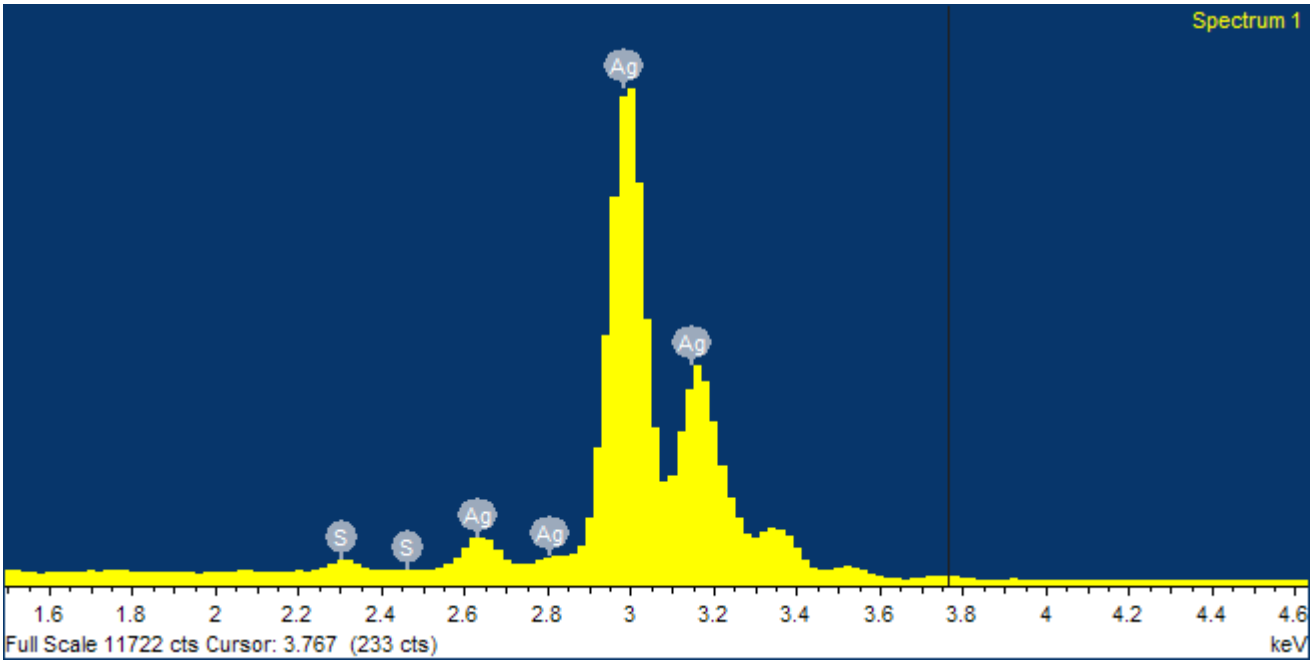
Note: Standard deviation calculated on 6 determinations.

3.1- Typical EDS analysis data set for GSH capped NPs

Spectrum processing :

Element	Weight%	Atomic%
S K	0.84	2.77
Ag L	99.16	97.23
Totals	100.00	





3.2 - Typical EDS analysis data set for cysteine capped NPs

Spectrum processing :

Element	Weight%	Atomic%
S K	3.47	10.80
Ag L	96.53	89.20
Totals	100.00