Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting information - Chirality transfer from organic ligands to silver nanostructures via chiral polarization of the electric field

Time resolved analysis of L/D-Cysteine g value and particle growth

The optical acitivity was measured after different reaction times. TEM images were taken accordingly. No TEM image was taken after 6h, as there was not much change in the optical activity. The g-value data have been smoothed by the means of a 10 point savitzgy-golay filter.

TEM images were acquired using a JEM-1400 microscope from JEOL and evaluated with ImageJ. CD and UV/VIS spectra were recorded on a J-815 spectrophotometer from Jasco.

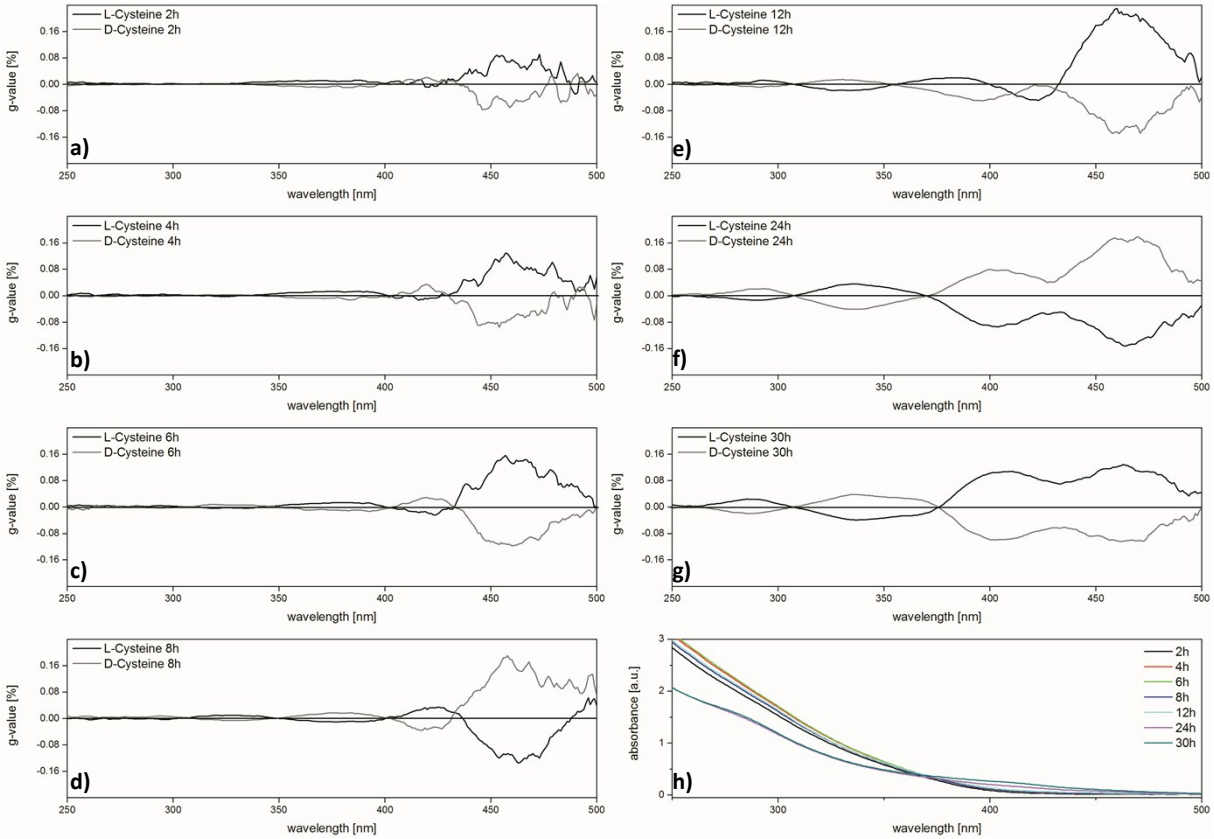

Fig. SI 1: a-f) g values for different reaction times of D/L-Cysteine and $AgNO_3$ are shown. The samples were measured without further purification. **h)** According absorption spectra are depicted for the reaction with D-Cysteine. L-Cysteine samples are showing the same absorption.

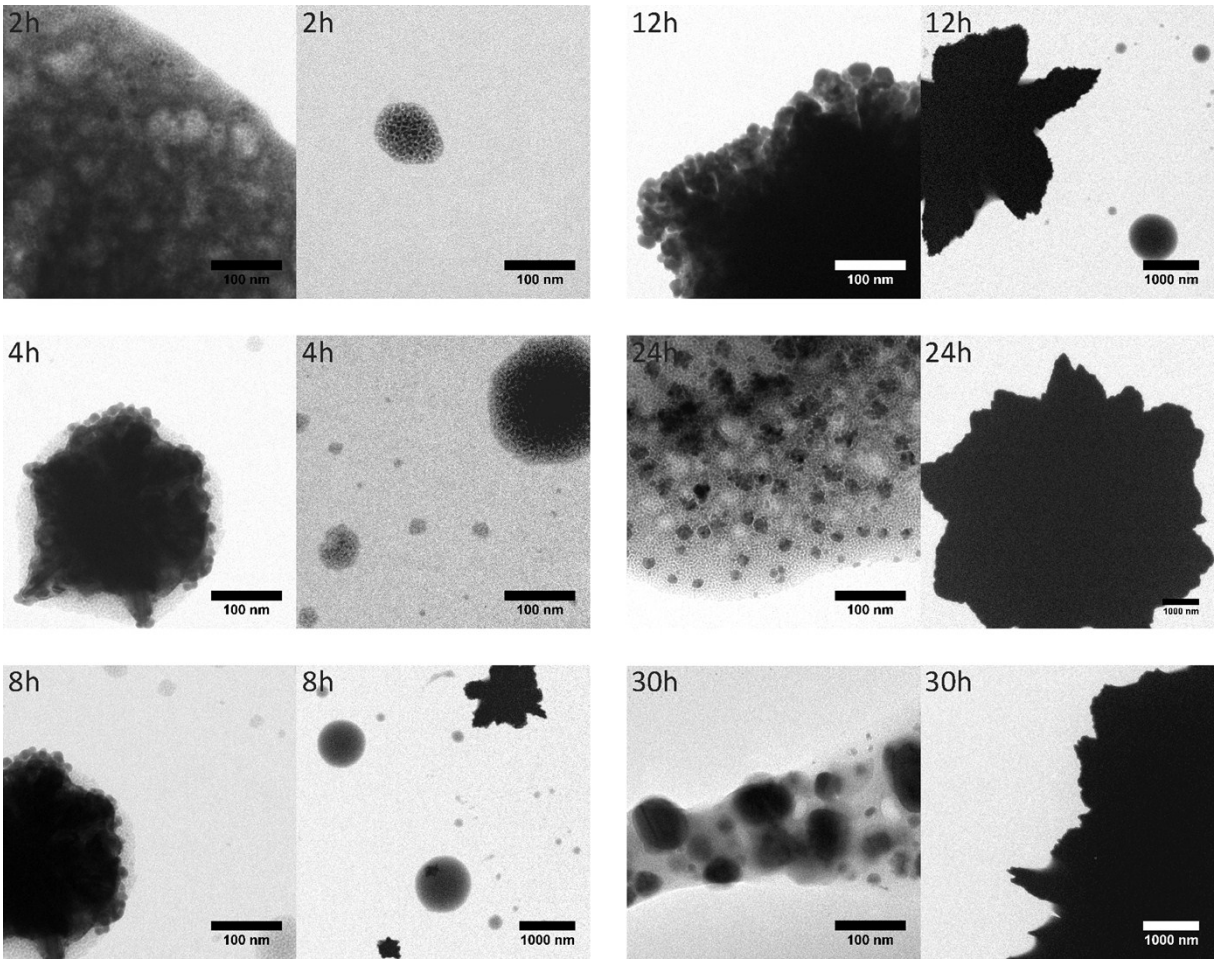

Fig. SI 2: TEM images of the reaction between **D-Cysteine** and $AgNO_3$ at 35°C. A part of the sample has been taken out from the reaction and was drop casted on a TEM grid immediately. Afterwards CD spectra were taken.

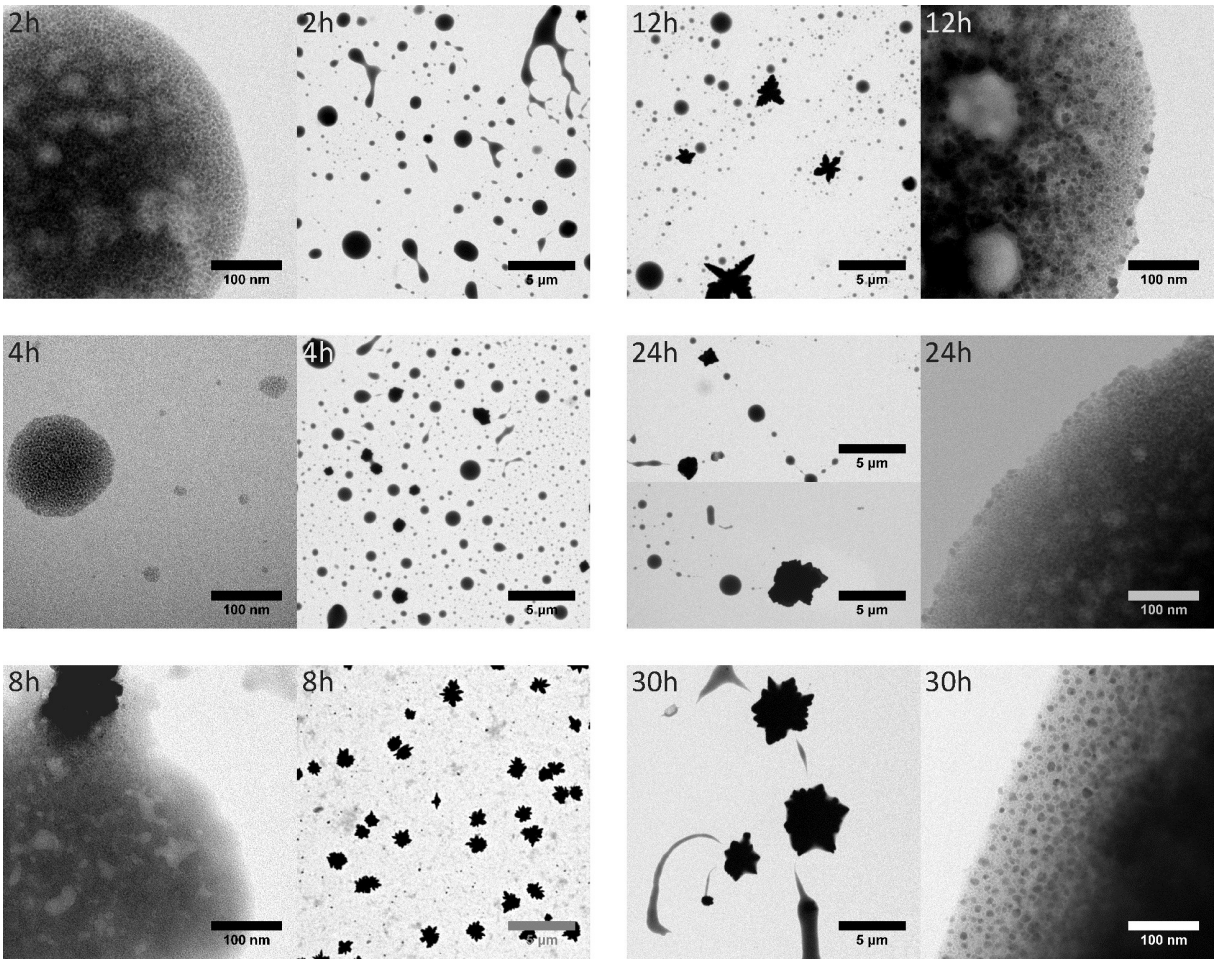

Fig. SI 3: TEM images of the reaction between **L-Cysteine** and $AgNO_3$ at 35°C. A part of the sample has been taken out from the reaction and was drop casted on a TEM grid immediately. Afterwards CD spectra were taken.

Photoelectronspectoscopy (XPS)

In the following XPS spectra of the prepared materials for different elements are shown. The binding energy in eV is plotted against the number of counts. A step size of 0.1 eV was chosen for all measurements. Spectra were recorded on a specs device equipped with a Phoibos 150 2D CCD hemispherical analyzer and Focus 500 monochromator. The detector angle was set perpendicular to the surface and the used X-ray source was aluminum Kα.

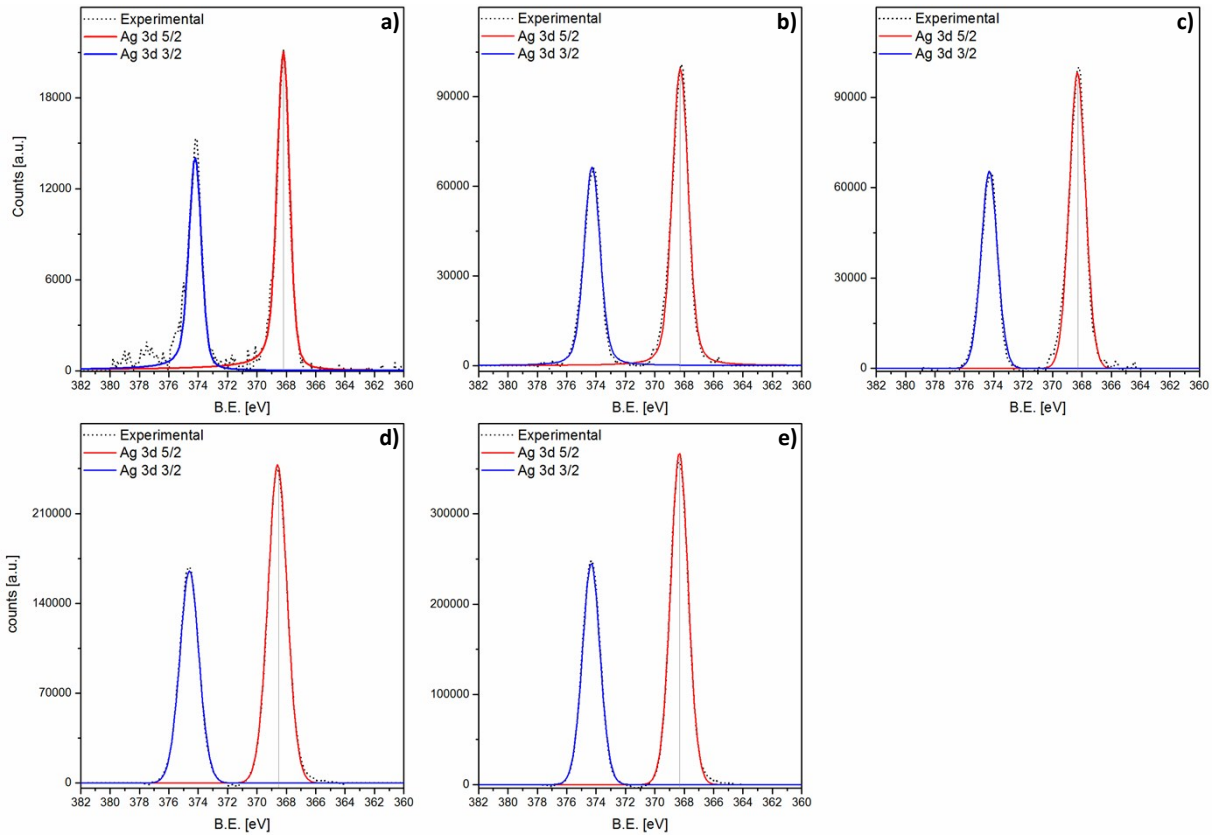

Fig. SI 4: Fitted XPS spectra of **Ag3d** are shown for **a)** citrate stabilized AgNP, **b)** L-Glutathione capped AgNP, **c)** L-Glutathione capped silver nanostructures, **d)** L-Cystein capped silver nanostructures and **e)** D-Cystein capped silver nanostructures. The experimental data are represented by dotted lines.

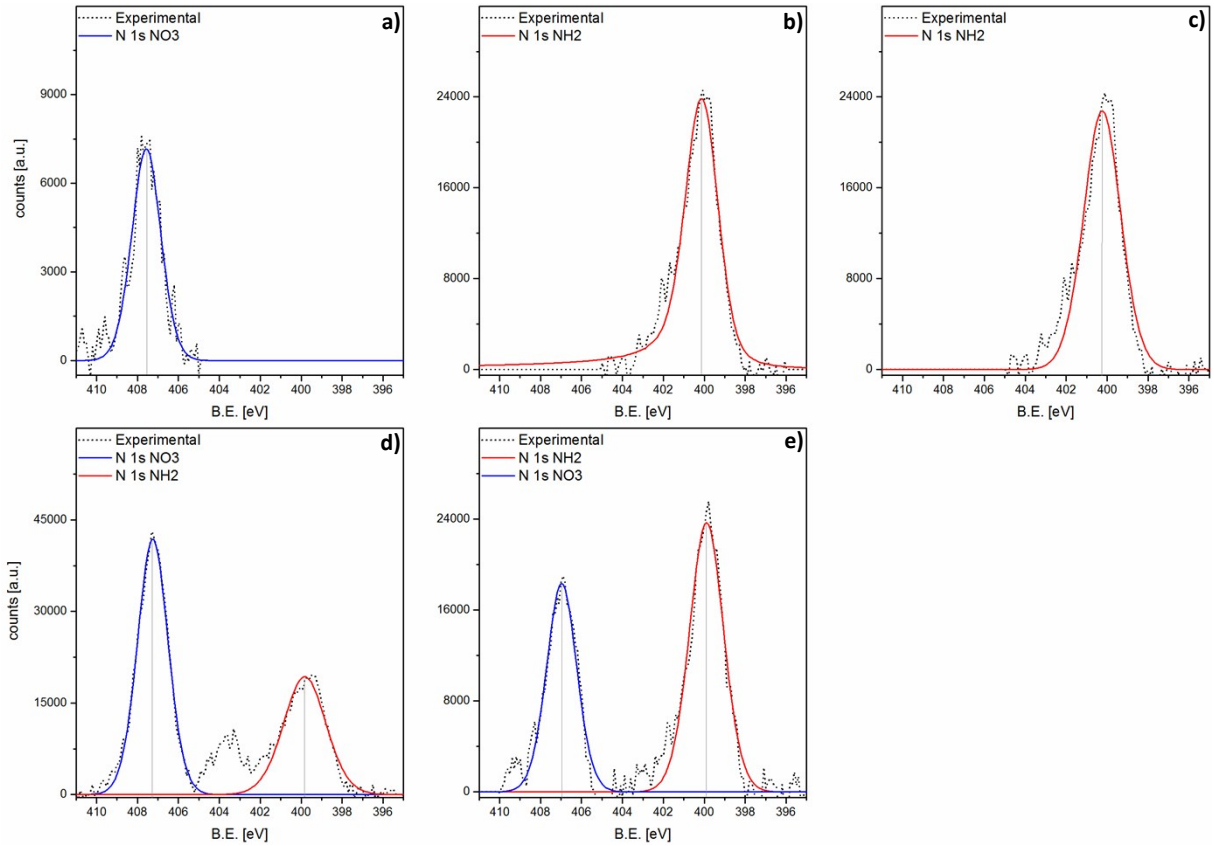

Fig. SI 5: Fitted XPS spectra of **N1s** are shown for **a)** citrate stabilized AgNP, **b)** L-Glutathione capped AgNP, **c)** L-Glutathione capped silver nanostructures, **d)** L-Cystein capped silver nanostructures and **e)** D-Cystein capped silver nanostructures. The experimental data are represented by dotted lines.

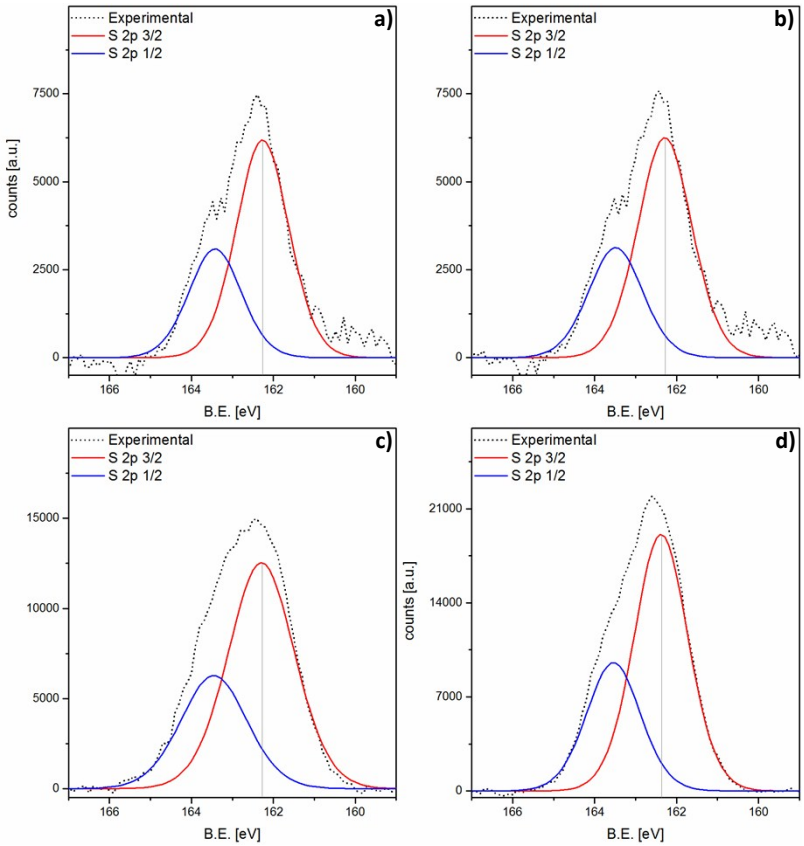

Fig. SI 6: Fitted XPS spectra of **S2p** are shown for **a)** L-Glutathione capped AgNP, **b)** L-Glutathione capped silver nanostructures, **c)** L-Cystein capped silver nanostructures and **d)** D-Cystein capped silver nanostructures. The experimental data are represented by dotted lines.

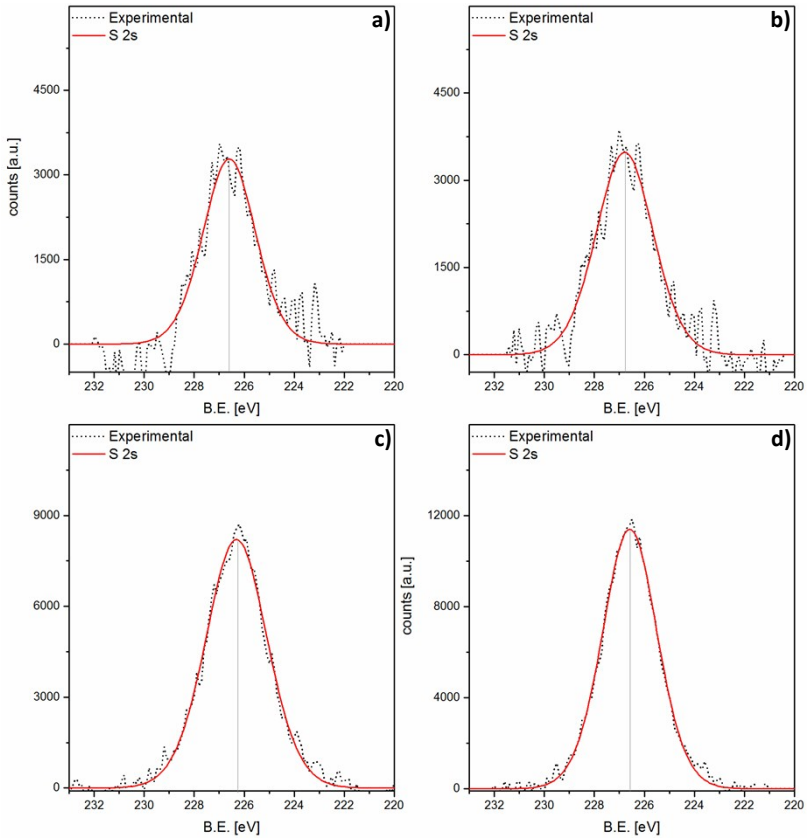

Fig. SI 7: Fitted XPS spectra of **S2s** are shown for **a)** L-Glutathione capped AgNP, **b)** L-Glutathione capped silver nanostructures, **c)** L-Cystein capped silver nanostructures and **d)** D-Cystein capped silver nanostructures. The experimental data are represented by dotted lines.

Scanning Electron Microscopy

To further investigate the composition of the obtained materials EDX analysis was performed for representative samples. Both samples have been cleaned by centrifugation and redispersion in UPW, also the structure made from Cysteine, as in EDX an intact particles can be picked for analysis. From the data in **Table SI 1**, it can be concluded, that the formed structures consist of elemental silver and not $AgNO_3$ as the nitrogen signal was below detection limit in both cases. Also it appears, that the structures have a similar composition regarding their relative content of silver and sulfur.

SEM and EDX data were obtained with a JSM-7500F from JEOL equipped with an XMax detector from Oxford Instruments.

Table SI 1: Elemental Analysis by the means of EDX. Nitrogen is not shown as it was always below quantification limit. Measurements performed on a carbon coated TEM grid.

Used Ligand	Silver [atom %]	Sulfur [atom %]	Oxygen [atom %]	Carbon [atom %]
L-glutathione	14.51	3.98	19.19	62.62
D-cysteine	19.63	3.83	25.18	51.36

SEM images and EDX graphs

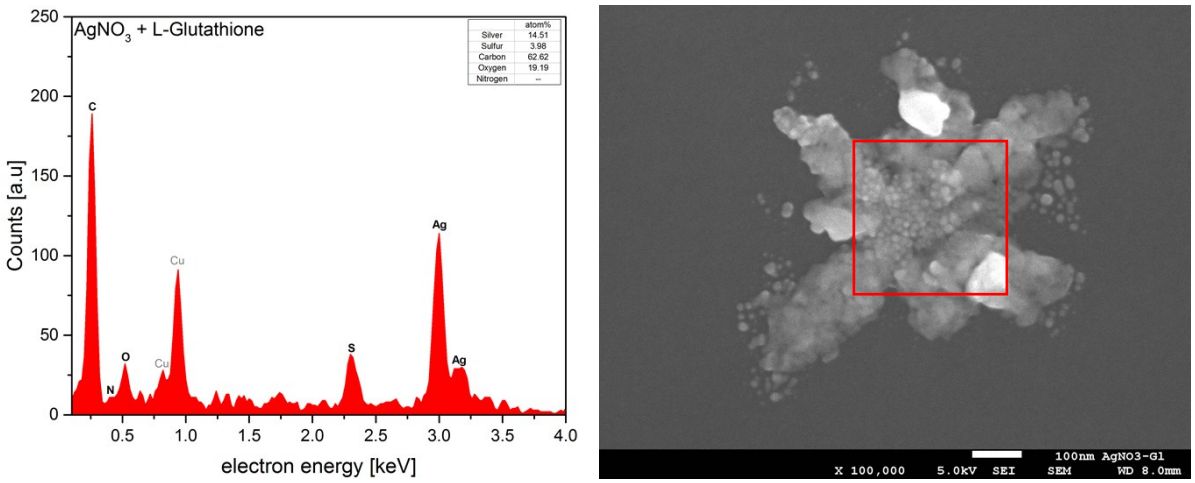

Fig. SI 8: EDX graph (left side) and SEM image including area of measurement (right side) for particles generated by reduction of $AgNO_3$ with L-Glutathione.

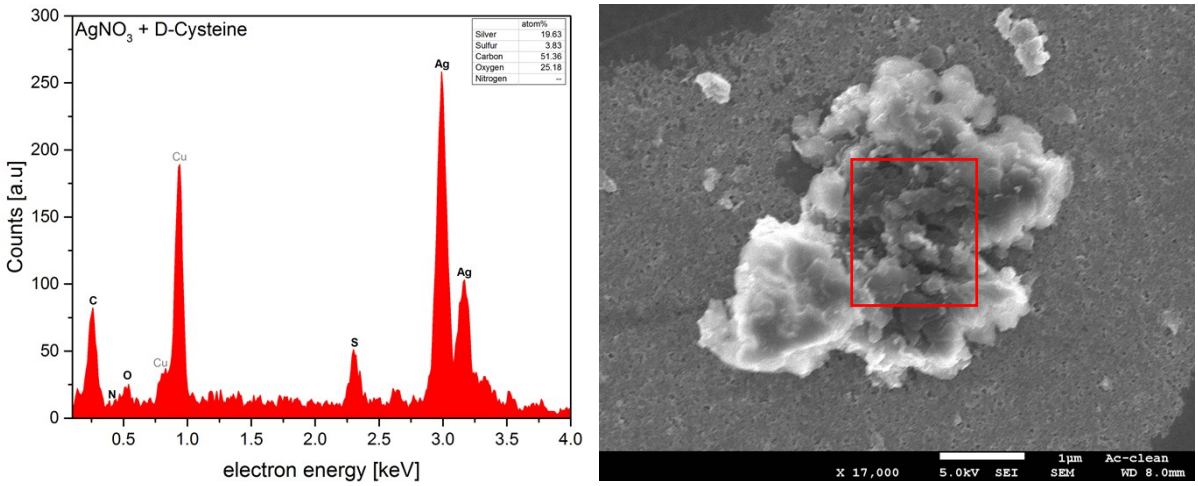

Fig. SI 9: EDX graph (left side) and SEM image including area of measurement (right side) for particles generated by reduction of $AgNO_3$ with D-Cysteine without heating.