

### Studies of the structure and morphology of gold nanoparticles in solution by TEM, SAXS and UV-vis

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Gold nanoparticles have a great number of applications in medicine, such as the specific drugs delivery systems or more accurate and less expensive diagnostic and genetic tests.

The aim of this study was a characterization of the structure of gold nanoparticles in solution. The synthesis of nanoparticles was performed by Turkevich method, by reducing tetrachloroauric acid in the presence of trisodium citrate, and also using this method with the addition of dimeric surfactants (chloride and propionate 1,1'-(1,4-butan)bis3-dodecyloxymethylimidazolium and other).

The morphology and size distribution of the obtained gold nanoparticles were examined using electron microscopy TEM and small angle X-ray scattering of synchrotron radiation (data collection on BLi9-11-4, MAX-lab, Lund, Sweden  $\lambda=0.091$  nm). For the obtained nanoparticles solution we have observed plasmon resonance corresponding to the presence of gold nanoparticles with sizes ranging from 5-100 nm. TEM images confirmed the spherical shape of nanoparticles obtained in aqueous solutions of sodium citrate  $\text{HAuCl}_4$  and show the presence of gold nanoparticles with tetrahedral morphology in solutions with added surfactant (Fig.1).

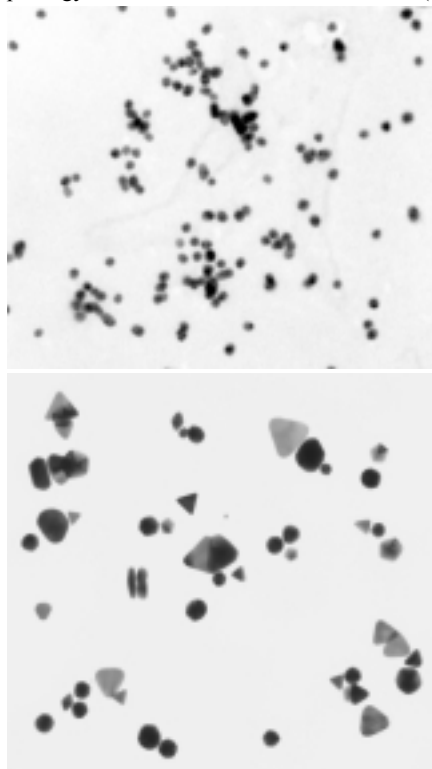


Figure 1 An example of TEM image of gold nanoparticles obtained without the addition of surfactant (top) and in the presence of sur-

factant GC12P (bottom).

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