



6th International Conference on Nanotechnologies and Biomedical Engineering  
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## **Preliminary Study on Silver Nanoparticle Synthesis Through Chemical and Biological Methods**

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### **Abstract**

This research was focused on the synthesis and characterization of silver nanoparticles, known for their various utilizations in the people daily life. Aiming the promotion of eco-friendly nanoproducts, we present a comparison between the properties of silver nanoparticles synthesized by chemical reduction method and biological method based on the reduction with antioxidants from plant extract. The formation of colloidal silver nanoparticles was evidenced by the recordings of the characteristic spectral band (due to the phenomenon of localized surface plasmon resonance) in the UV-Vis range for both types of samples. The citrate-AgNP suspension, synthesized by reduction with trisodium citrate reagent, was characterized by relatively broad band with maximum at 425 nm while green tea-AgNP suspension, synthesized with green tea leaf extract, presented the characteristic band with maximum at about 445 nm. Highest intensity of LSPR band was noticed for the AgNPs synthesized by the eco-friendly method denoting remarkably better efficiency of the biological reducers. The good granularity in the nanometric domain was revealed by Scanning Electron Microscopy for both samples while the elemental composition was confirmed by Energy Dispersive Spectroscopy. The optimization of the biological synthesis with green tea extract is designed to efficiently provide silver nanoparticles for biomedical applications that are more friendly with the environment.

*Keywords: silver nanoparticles, colloidal suspensions, green synthesis*



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