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Structure analysis of gold nanorods obtained using selected oligomeric surfactants

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The interest in metallic nanoparticles has been growing in recent years. Obtaining different shapes and sizes of nanoparticles allows us to tune their properties and applications. The ability to modify these nanostructures with surfactants is particularly important for wider biomedical applications. It allows attaching macromolecules important for biomedicine and avoiding aggregation of nanostructures. The aim of this study was to synthesize gold nanorods (GNRs) by modified method using seeding growth and analyse them used several methods. To compare the influence on the morphology five oligomeric gemini surfactants (Cl_C6_C8, Cl_C6_C12, imi Cl_C6_12, Cl_C6_C16, imi Cl_C6_16) and two different concentrations of silver nitrate were present during the stage of growth.

Obtained nanoparticles were characterised using microscopic and spectroscopic techniques, including UV-Vis spectroscopy, Transmission Electron Microscopy (TEM) and Atomic Force Microscopy (AFM). Using these methods, the information about shape and size of synthesised nanorods was achieved, which permits to choose the most promising way of synthesis modification. Furthermore, the sample with the best morphology will be modified and tested for biomedical applications.

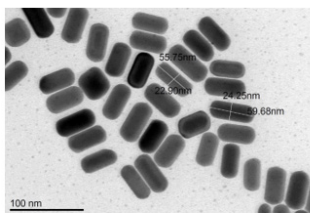


Figure 1 Transmission Electron Microscopy image of synthesized nanorods.

Biography

Joanna Maksim is a fourth-year medical physics student. She studies at Adam Mickiewicz University in Poznan, at Faculty of Physics and works on her master thesis at Department of Macromolecular Physics. In this work, she synthesizes rod-shaped nanoparticles which could have biomedical applications and characterizes the microstructures of obtained nanoparticles using spectroscopic and microscopic methods. This research project was supported by programme Best of the Best (Najlepsi z Najlepszycy) 3.0 from Ministry of Science and Higher Education (Poland).

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