

Nanochemistry and biotechnology

Synthesis of anisotropic gold nanoparticles by using of plant extracts

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Among metal nanoparticles, gold nanoparticles are determined as important tool for many applications, like for diagnosis and treatment of diseases [1, 2]. It has been demonstrated the strong influence of shapes and sizes on optical, catalytic and electromagnetic properties [3].

The green syntheses of metal nanoparticles are in focus of researchers due to many advantages, including of the use of non-toxic reagents, straightforward reaction, and biocomparability. In same time, phytosynthesis is a route for development of shape selective synthesis of plasmonic nanoparticles.

Aqueous dispersions with high concentrations of gold nanoparticles were synthesised by green route by direct interaction of hydrochlorauric acid with aqueous extracts of selected medicinal plants (*Menta piperita*, *Calendula officinalis* L. etc.) as a reducing and capping agents. The formation of anisotropic gold nanoparticles (quasi-spherical, triangle, hexagonal and nanorods) was observed. Obtained nanoparticles were characterized using UV-visible absorption spectroscopy, X-ray diffraction and EDX. The morphology of nanoparticles was studied by high-resolution transmission electron spectroscopy. The effect of concentration, pH variations on optical and plasmonic properties of metal nanoparticles was studied.

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2. *Khan M.S., Vishakante G.D., Siddaramaiah H.* Gold nanoparticles: a paradigm shift in biomedical applications // *Adv Colloid Interf Sci* - 2013. - **199-200**, P. 44-58.
3. *Burda C., Chen X., Narayanan R., El-Sayed M.A.* Chemistry and properties of nanoparticles of different shapes // *Chem Rev.* - 2005. - **105**, P.1025-1102.