

GOLD AND SILVER NANOPARTICLES - TAILORED SYNTHESIS, IMMOBILIZATION AND PHASE TRANSFER

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Abstract

Preparation of stable aqueous dispersion of nanoparticles of precious metals using just one method represents challenging task, which has been achieved thanks to the synthesis using only the corresponding metal salt and a hyperbranched polyethylenimine. Based on the synthetic conditions the process enables preparation of Ag/Au nanoparticles with the effective diameter from units up to tens of nanometers with extraordinary temporal and chemical stability and simultaneously exhibiting biological activity. Interestingly, the same method can be used for the immobilization of the nanoparticles on different substrates including nanofibers of polymeric nature. The immobilization task reacts to the raised toxicological questions concerning the thread of nanomaterial release into the environment and as such represents application output. Additionally, the as-prepared dispersions of Ag/Au NPs can be easily dried/lyophilized and the obtained powder again re-dispersed without any significant changes in fundamental characteristics, which also has not been reported previously.

Keywords: Ag nanoparticles, Au nanoparticles, synthesis, immobilization

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