Diploma thesis abstract.

Synthesis and optical extinction spectroscopy of silver nanoparticles in transparent dielectric media.

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This paper presents the results on synthesis and characterization of silver nanoparticles in the pores of several nanoporous materials: aerogel, nanoporous glass, and oligo(urethane methacrylate). The method used is based on the impregnation of the porous sample by a solution of a silver precursor, following by reduction of silver atoms and their clusterization within the pores. Supercritical carbon dioxide was used as a solvent providing effective impregnation of the nanoporous samples due to high solvent power and low viscosity. Reduction of silver atoms was stimulated by laser radiation at the wavelengths of 405 and 532 nm or by heating of the sample. The extinction spectra of the composites were recorded during the synthesis process allowing observation of the dynamics of formation of nanoparticles. The analysis based on the calculations of the plasmonic extinction allowed characterization of the size and shape of nanoparticles.