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The study of the Optical Properties of Ag Pyramid Nanostructures by Discrete Dipole Approximation Method

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Abstract

In this paper, we investigate the optical properties of silver pyramid nanostructures (SPNs) by means of discrete dipole approximation (DDA) when these nanoparticles are embedded into the water. Absorption, scattering and extinction cross-sections of the SPNs are calculated by the change of the incident wavelength in the visible and near infra-red region. Moreover, height, wavelength and full width at the half maximum (FWHM) of extinction cross-section peaks (due to plasmon resonances) were studied by the change of in the nanostructure's size and the dielectric constant of medium. Our results show that there are only two peaks of dipole and quadruple modes in this spectrum.

Keywords: Ag pyramid nanostructures, Discrete Dipole Approximation, plasmon, cross-sections

For full article, refer to the Persian section