

Nanocomposites and nanomaterials

Preparation of fluorescent polymer nanocomposites with inclusions of silver nanoclusters

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The aim of the study was the creation of new fluorescent nanocomposites with the inclusion of silver nanoclusters and development of suitable methods for their synthesis and stabilization. The developed methods provide an opportunity to set up and optimize the fluorescent properties of the nanocomposites by incorporating silver nanoclusters in polymers, peptides and other biopolymers [1-4]. Fluorescent nanocomposites obtained from thioflavine T and silver nanoclusters with polymers poly(methyl methacrylate-co-methacrylic acid), poly(methyl methacrylate), poly(vinyl acetate) in ethylacetate. Recovery of silver took place by irradiation of solutions with a wavelength of 360 nm. At that it was optimized concentration, exposure time and the sequence of addition of reagents. The process of creating nanocomposites was controlled by changing spectra absorbance, excitation, emission.

Fluorescence nanocomposites was stable, which makes it possible to obtain images on confocal microscope with laser excitation wavelength of 405 nm.

Covalent interaction of silver cluster-organic dye with polymer or protein can be used to test different ligands and determination their affinity on the basis of competitive replacement. Nanocomposites can be used in the first place as a material for imaging in the biological research, clinical medicine, and the creation of new sensors.

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