МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
БУКОВИНСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ»

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Конференція внесена до Реєстру заходів безперервного професійного розвитку, які проводитимуться у 2023 році №5500074

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properties can be altered not only by changing the size of the quantum dots, but also by changing their composition, the ratio of concentrations of precursors and stabilizer, the nature of the stabilizer, the temperature of the mixture during synthesis and post-synthetic heat treatment, and the formation of a passivating membrane.

Nowadays, various strategies for synthesizing $AgInS_2$ nanoparticles (NPs) have been proposed, such as hydrothermal, solvothermal and hot injection synthesis, as well as synthesis in an aquatic environment. Compared to approaches based on organic substances, the synthesis in an aquatic environment is more reproducible, inexpensive, environmentally safe, and biocompatible, and the prepared samples are water-soluble, which is especially important for further biomedical implementing. The composition of ternary QDs can be controlled by the synthesis conditions, most studies usually focus on optical and/or photovoltaic properties which depend on the composition of the QDs.

The aim of the study. The aim of the work was the introduction of $AgInS_2$ nanoparticles into crystals of ionic salts from the aquatic phase to obtain promising photoluminescent (PL) materials.

Material and methods. PL spectra were recorded at room temperature using Ocean Optics USB2000+ (powder analysis) and USB650 (solution analysis) spectrophotometers with SpectraSuite software. A solid-state laser with a wavelength of 405 nm was used as an excitation source.

Results. Photoexcitation in quantum dots creates an exciton that is limited by the volume of the semiconductor nanoparticle. Due to the quantum-size effect, the decrease in the diameter of the quantum dot leads to an increase in the energy of the forbidden zone and discretization of the energies of electronic levels. As a result, the absorption and emission spectra of quantum dots depend significantly on their size and shift to the short-wavelength area as the diameter of the nanoparticle decreases.

The radiation of semiconductor nanoparticles can be characterized by four main parameters: brightness, the position of the photoluminescence maximum, the spectral width of the radiation (purity of color), and the stability of the radiation in time.

Conclusions. A clear dependence of the effect of the initial ratio between the indium and silver precursors and the heat treatment time on the optical properties and photostability has been established: an increase in [In]:[Ag] and the duration of the post-synthetic heat treatment leads to an increase in the photoluminescence intensity and photostability for $AgInS_2$ and $AgInS_2$/ZnS QDs.

The results of atomic adsorption spectroscopy indicate that the formation of the ZnS membrane on the surface of $AgInS_2$ quantum dots is not due to the epitaxial growth of ZnS on the surface of the particles, but due to the cation exchange between Zn^{2+} and In^{3+}.

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SYNTHESIS AND ANTIMICROBIAL ACTIVITY OF 4-NITROIMIDAZOLE-5-THIOACETIC ACID HYDRAZIDES

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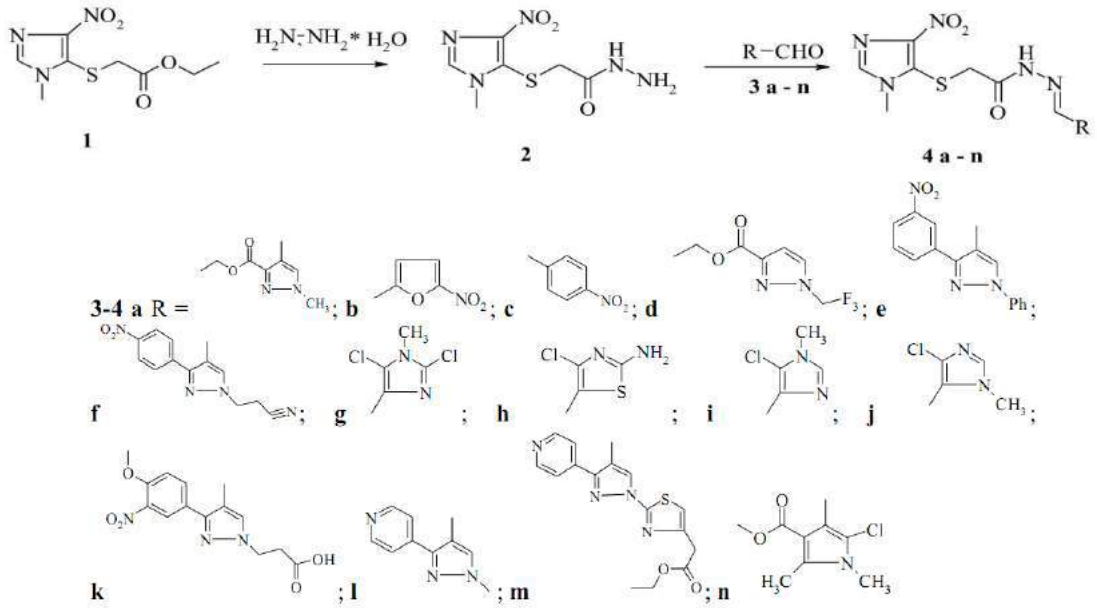
Introduction. In modern methodologies of the rational construction of new biologically active substances and leader compounds for the creation of medicinal products, imidazole-containing structures play a key role due to their powerful medical and biological potential. An important place among imidazoles is owned by various types of their functionalized derivatives, which are characterized by antibacterial, antifungal, anticancer, antituberculosis and mutagenic effects.

The aim of the study. In general, the nitroimidazole scaffold turned out to be very effective for the design of a wide range of bioactive compounds with pronounced antimicrobial and antituberculosis effects, selective agonists of the histamine H_3 receptor, inhibitors of mitogen-activated protein kinases. Modification of the nitro-containing imidazole cycle with other functional

groups proved to be quite productive for the construction of structures with increased pharmacological potential.

Materials and methods. All reactants were of "reagent" purity and were used in the experiments without further purification. All solvents used in this work were purified according to standard methods. The output ethyl ether of 1-methyl-4-nitroimidazole-5-thioacetic acid and 4-pyrazolecarbaldehydes were synthesized by experimental methods.

Results. The synthetic aspect of the problem was solved by a two-stage transformation of the available basic substrate - ethyl ester of 1-methyl-4-nitroimidazole-5-thioacetic acid 1. In the first stage, as a result of boiling ester 1 in ethanol for 3 hours with 90% hydrazine hydrate, hydrazide was obtained 1-methyl-4-nitroimidazole-5-thioacetic acid 2 with a yield of 92%. Its further boiling in ethanol for 3 hours with heterylaldehydes 3a-n leads to the formation of hydrazones 4a-n, which were isolated with output of 67-92%.



Conclusions. New N-heterylidene hydrazides of 4-nitroimidazole-5-thioacetic acid have been synthesized by condensation of 1-methyl-4-nitroimidazole-5-thioacetic acid hydrazide with various furyl, pyrrole, pyrazole, imidazole, and thiazole carbaldehydes. The initial microbiological screening of the synthesized compounds has revealed the presence of a pronounced antimicrobial effect among them and showed the prospects of their further deep research.

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TEMPORAL PROFILES OF THE WATER-SOLUBLE COMPONENTS OF SOME OIL PRODUCTS: THE SOLUBILITY LIMITS AND DISSOLUTION/EVAPORATION BALANCE

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Introduction. Approximate water-solubility limits were determined for gasoline/water mixtures using an original method of UV-spectrometry. During the preliminary investigations it was found that some comparatively soluble oil compounds can form an aqueous solution with a limit concentration approximately 0.35 g/L (for gasoline-water mixtures).

The aim of the study. The same experimental method was applied to determine the temporal changes in concentration of the water-soluble compounds of some potential oil pollution agents of water: gasoline, diesel fuel and regular motor oil.