grinding with anhydrous sodium sulphate followed by the extraction clean-up procedure with the *n*-hexane-acetonitrile solvent system. Melipramine was detected and determined in the extracts with help of colour reactions, TLC and UV spectrophotometry.

Results and discussion. The following coloured products of melipramine interaction with the range of chromogenic reagents were observed: UV light (λ_{254}) (brown-red fluorescence, sensitivity was of 0.2 μg in the sample), Dragendorff reagent with Munier modification (orange, sensitivity was of 1.0 μg), ninhydrin solution (light pink, 4.0 μg), Mandelin's reagent (blue, 10.0 μg), Lieberman's and Froehde reagents (blue, 2.0 μg). The following values of chromatographic mobility of the antidepressant in thin sorbent layers were obtained in a range of mobile phases for Merk chromatographic plates: ethyl acetate – methanol – 25 % ammonia (85:10:5), $R_f = 0.72 \pm 0.05$; acetone, $R_f = 0.50 \pm 0.03$; toluene – acetone – ethanol – 25 % ammonia (45:45:7.5:2.5), $R_f = 0.68 \pm 0.03$, chloroform – dioxane – acetone – 25 % ammonia (47.5:45:5:2.5), $R_f = 0.49 \pm 0.02$. Absorption maximum for the melipramine solution in 0.1 mol/l hydrochloric acid was observed at the wavelengths of 251 ± 2 nm (A^1_1 284). Quantitative determination of melipramine in the biological extracts was determined by UV spectrophotometric method after TLC clean-up procedure. The calibration curve was described by the equation of $y = 0.0421 \cdot x - 0.043$. Recovery of the developed isolation method was 54.3 % (RSD=5.5 %).

Conclusions. The effective method of the sample preparation of the biological material considering the melipramine lipophilicity has been proposed.

METHODS OF ANALYSIS IN BIOMEDICAL AND PHARMACUTICAL RESEARCHES

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Introduction. The use of radioactive isotopes for the study of the drugs metabolism and biogenic elements in the human body.

Aim. The use of radioactive nuclides in medicine and pharmacy is explained by the high sensitivity of its methods (10^{-19} g), economic and environmental safety, rapid excretion from the organism, selectivity, accuracy of registration, simplicity and cheapness of use. Radionuclides are used in diagnostics, biomedical researches and medical therapy.

Materials and methods. Synthetic radioactive isotopes are obtained by bombarding the substance with protons, neutrons, alpha particles or high energy gamma rays in the nearest nuclear reactors and charged particle accelerators. Nowadays, artificial radionuclides of all chemical elements that occur in nature have been received.

There are three main methods of using radioactive isotopes.

1. The method of radioactive tracers: radioactive isotopes are used as a “tag”. Radioactive tracers - are radioactive nuclides that are injected into simple or complex substances to study their chemical, biological, physiological and other processes using special methods such as radiometry, mass spectrometry and others. Synthetically obtained radioactive nuclides don`t differ in chemical and some physical properties from stable isotopes of the same element. The injection of the element`s radioactive isotopes into the living organism signals about the movement of the entire mass of atoms of the exact element. In the investigated objects radionuclides are detected by their identification characteristics: by type of radiation energy and half-life. The application of this method allows studying complex metabolic processes, the path and topography of the element in the body. As a rule short-lived isotopes are usually used as radioactive "tags", for example: ^{3}H, ^{14}C, ^{32}P, ^{35}Ca, ^{59}Fe, ^{131}I, ^{60}Co, ^{24}Na, ^{95}Nb etc.

2. Methods that use high penetrating radiation: are used to determine the structure of molecules.

3. Methods using the effect of radiation itself: are used to study the distribution of substances in the body, their migration routes, mechanisms of reactions and quantitative analysis.

Results and discussion. Radioisotope diagnostics (RD) makes it possible to recognize diseases and study the functions of organs and body systems in normal and pathological conditions. For this purpose, a number of methods are used in the RD: the method of dilution, the method of studying the rate of excretion of the isotope, the method of radioactive tracers, etc. RD methods are based on the injection of radioactive nuclides into the body, the amount of which predicts the presence of drugs in exact organ. The results of the researches make it possible to analyze the work of the organ or tissue, to study the excretory function, the blood flow velocity, the medications mechanism, etc.

Radioisotope therapy is a combination of methods of treatment with radioactive isotopes. The technique is based on the biological effect of ionizing radiation on living cells and the selective accumulation of isotopes upon their injection into the body. Synthetic radioactive nuclides are used for the treatment of cancer (60Co, 198Au, etc.), blood diseases (32P), skin and eye diseases (32P, 90Sr), digestive and respiratory organs (222Rn). In this case, radiation damage does not occur, due to the fact that half-life of isotopes ranges from several minutes to several days.

The use of ionizing radiation is also relevant for pharmacology in studying the modern radio-ecological state of medicinal raw materials.

Conclusions. Radioactive isotopes are widely used in all fields of science and technology, particularly in biology, medicine and pharmacy for the study of metabolic processes at the cellular level, the enzyme`s and hormone`s mechanism of action, the analysis of drugs and medicinal raw materials, the diagnosis and treatment of many diseases.

DEVELOPMENT AND STUDY OF THE ION-SELECTIVE ELECTRODE FOR GENTAMICIN SULFATE

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Introduction. Gentamicin is an antibiotic of the aminoglycoside group with a broad spectrum of action and is used in severe infectious diseases in the case of resistance of bacteria to less toxic antibiotics. However, with its prolonged use or overdose the following side effects can be observed: nausea, vomiting, hyperbilirubinemia and various allergic reactions, such as rash, itching, Quincke's edema. In this regard, there is a need to develop rapid and simple methods for the analysis of gentamicin sulfate both in dosage forms and in such biological fluids as saliva, blood, and urine.

Aim. To develop and study the analytical characteristics of ion-selective electrode (ISE) suitable for gentamicin sulfate with the ion associates of gentamicin with silicon tungstic acid suggested for its membrane as an electrode active substance.

Materials and methods. For the analysis of gentamicin sulfate the method of ionometry was chosen. This method is the most promising and rapid method of analysis; it also allows to carry out the analysis by a biologically active moiety of a molecule.

Results and discussion. The ISE for gentamicin sulfate has been developed; it is a thick-walled polyvinyl chloride tube filled with the solution of gentamicin sulfate. On the ground end of the tube the cut membrane (using polyvinyl chloride glue) containing activated carbon is pasted. The membrane composition (%) is polyvinylchloride – 26±3, dibutylphthalate – 52±5, gentamicin silicon tungstate – 17±2, activated carbon – 4±1. Our studies have shown that the electrode function of the ISE made is linear in the concentration range of $(1.0\pm0.2)\cdot10^{-2}$ - $(3.0\pm0.2)\cdot10^{-4}$ M with the electrode slope of S =26±1 mV, it corresponds the characteristics of ISE for a divalent ion. The response time of electrodes is 20-30 seconds, the ISE potential drift per week does not exceed 3-5 mV, and their operating resource is not less than 6 months.

Conclusions. The ISE suggested for gentamicin sulfate can be used for ionometric analysis of gentamicin sulfate in dosage forms.