gramphic analysis. UV/Vis Spectophotometric Methods. As a result of a series of conjugated double bonds, most carotenoids absorb in the range of 400–500 nm (although some lycopene precursors, such as phytoene and phytofluene, absorb maxi-mally in the UV region). Spectral information is a useful tool for distinguishing and identifying different carotenoid species; however, it is important to keep in mind that, for common carotenoids, the UV/Vis spectra only provides information about the chromophore of the carotenoid. For example, α-carotene and lutein cannot be identi-fied from each other solely by spectra, and other factors, like retention time, must be considered in distinguishing between these two compounds. Additionally, carotenoid spectra can be influenced by different solvents and carotenoids can interact with pro-teins and lipids, altering spectral characteristics. Carotenoids are unique in that many species usually have three more-or-less distinct peaks instead of a single band. Diffe-rent carotenoids can vary significantly in their wavelength of maximum absorption as well as in their fine structure.

Results and discussion. Soxhlet extraction is a type of atmospheric liquid extraction, utilizing solvents at boiling temperature and low pressures (ambient pres-sure), for the selective extraction of targeted compounds. Soxhlet extraction is a con-ventional technique providing the highest recovery of carotenoids. Thus, it is com-monly used for evaluating the performance of other methods. However, it's time consuming, and also uses significant amounts of solvents, thus increasing the cost of extraction. Additionally, the high temperature and long extraction time increases the possibilities of thermal degradation and cis-trans isomerization of carotenoids. Obtai-ning a lipophilic extract from Erigeron annuus L. herb took 30 g (exact sample) of the raw material and was extracted in a Soxhlet apparatus, solvent (500 ml chloroform). The yield of the lipophilic extract was 3.03%. Quantitative determination of carote-noids was performed by spectrophotometric method. 0.01 g (exact sample) of the lipophilic fraction was dissolved in 96% ethyl alcohol in a 25.0 ml volumetric flask, the optical density of the resulting solution was determined on a "Specord 2000" spectrophotometer at 440 nm in a cuvette with a layer thickness of 10.0 mm. Compensation solution - 96% ethyl alcohol. The concentration of carotenoids was calculated by the formula:

$$C_{carot.} = 4{,}7 * A_{440} - 0{,}27 * C_{chl.a+chl.b}, \text{ where}$$

A_{440} - optical density of the solution at a wavelength of 440 nm;

$S_{chl.a+chl.b}$ - concentration of chlorophylls (mg / l) α and b in solutions.

The content of carotenoids (mg / 100g) was calculated by the formula:

$$X = \frac{Ccarot \cdot V \cdot 100}{m \cdot 1000}, \text{ where}$$

In lipophilic herb extract of carotenoids the content of carotenoids is 1.6%.

Conclusions. Studies show the relationship between increased consumption of foods rich in carotenoids and the risk reduction of various diseases. The presence of carotenoids in Erigeron annuus L. herb has been determined by a spectrophotometric method. The study of biologically active compounds from Erigeron annuus L. herb is ongoing.

DETERMINATION OF FORMALDEHYDE BY REACTION WITH POTASSIUM CAROATE

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Introduction. Formaldehyde is produced worldwide on a large scale by catalytic, vapour-phase oxidation of methanol. Formaldehyde is used mainly in the production of various types of resin. Phenolic, urea, and melamine resins have wide uses as adhesives and binders in the wood-production, pulp-and-paper,

and the synthetic vitreousfibre industries, in the production of plastics and coatings, and in textile finishing. Polyacetal resins are widely used in the production of plastics. Formaldehyde is also used extensively as an intermediate in the manufacture of industrial chemicals and pharmaceuticals, such as 1,4-butanediol, 4,4′-methylenediphenyl diisocyanate, penta-erythritol, and hexamethylenetetramine. Formaldehyde is used directly in aqueous solution (known as formalin) as a disinfectant and preservative in many applications.

In general, aldehydes are among the most reactive organic compounds due to the polarization of the carbonyl group, due to the electronegativity of the oxygen atom. In analytical practice, the oxidation of aldehydes with free iodine in an alkaline medium is widely used. Iodine was added in excess, and then after 10 min of exposure in the dark, the residue was titrated with a standard 0.1 mol L^{-1} sodium thiosulphate solution. 1.00 ml of 0.05 M iodine solution corresponds to 1.501 mg of CH_2O.

A method based on the use of hydrogen peroxide as an oxidant: under the action of hydrogen peroxide, formaldehyde is converted (within 5 min on a water heater) to formic acid, which is immediately neutralized by previously added known excess alkali (the exact amount is set in the control experiment). The amount of unreacted alkali (titration with a standard solution of hydrochloric or sulfuric acids with the indicator bromothymol blue or phenolphthalein) calculates the content of formaldehyde in the test solution. 1.00 ml of 1.0000 mol L^{-1} alkaline solution corresponds to 30.03 mg of CH_2O).

Obviously, the method has the same disadvantage as the previous one: in the presence of hydrogen peroxide, compounds of different classes are oxidized, and therefore the solution to be analyzed should not contain other compounds.

For the quantitative determination of the content of formaldehyde in the drug "Formidron" (aqueous-alcoholic solution of formaldehyde), a sulfite method is recommended. It is based on the interaction of formaldehyde with an aqueous solution of sodium sulfite, resulting in the release of an equivalent amount of sodium hydroxide, which is titrated with a standard solution of acid.

$$HCOH + Na_2SO_3 + H_2O = HCH(OH)SO_3Na + NaOH.$$

1.00 ml of 1.0 mol L^{-1} hydrochloric acid solution corresponds to 30.03 mg of formaldehyde, which in the preparation should be 3.5 - 4.0%.

It is known that aromatic aldehydes under the action of acid are oxidized to carboxylic acids and / or phenols esters (Baeyer – Villiger reaction, 1899) depending on the nature of the substituent in the aromatic aldehyde nucleus and the acidity of the medium. Thus, the output of benzoic acid in the case of para-nitrobenzaldehyde reaches 98%.

To quantify the basic substance content in benzaldehyde, the hydroxylamine Walker method is used. The essence of the method is the interaction of formaldehyde with hydroxylamine hydrochloride to form formaldoxime and free hydrochloric acid.

$$CHOH + NH_2OH{\cdot}HCl = CH_2{=}NOH + H_2O + HCl$$

For quantitative interaction, the mixture was incubated for at least 15 minutes. The formed hydrochloric acid was determined alkalimetrically in the presence of bromophenol blue until the green color disappeared and the appearance of blue, the same as in the control experiment. Benzaldehyde content is calculated by the difference in the volumes of hydroxide solution consumed in the control and work experiments, respectively. 1.0 ml of 0.5 mol L^{-1} sodium hydroxide solution corresponds to 53.06 mg of benzaldehyde.

Titrimetric methods are characterized by low complexity, simplicity of hardware design and satisfactory accuracy.

Aim. To develop a simple and rapid method for the quantitative determination of formaldehyde in aqueous solutions, in particular in the pharmaceutical preparation «Formidron» using potassium hydrogen peroxomonosulfate as an analytical reagent.

Materials and methods. Formaldehyde Solution, min. 37% GR for Analysis.

Solution for external use (Antiseptic), «Formidron» (Formidronum) 50 ml alcohol in vials (Private Joint Stock Pharmaceutical Plant "Viola" m. Zaporizhzhya (Ukraine)). Active Ingredients: 100 g dissolve the expanded form, converting to 37% the content of the formal amount of 10 g, the level of 96% – 39.5 g. Excipients: Cologne – 0.5 g, water purification 50 g. The triple salt $2KHSO_5{\cdot}KHSO_4{\cdot}K_2SO_4$ (known by the

tradename Oxone) is a form with higher stability. Kinetic studies were carried out in buffer solutions under second-order conditions with $KHSO_5$ in the temperature 293 K. The reaction was followed by estimating the unreacted $KHSO_5$ as a function of time by using the iodometric method. 0.02 mol L^{-1} phosphate pH buffer solutions were used. The liberated iodine was titrated against 0.02 mol L^{-1} standard sodium thiosulphate solution. The method involves a titration against a blank followed by the titration against the unknown sample. The method is based formation of formic acid followed by iodometric titration of the unreacted $KHSO_5$. Calculate the amount of the formaldehide (FA) from the equation X(mg)=[(V_0 – V) × T × 10 , where V_0 is the volume of sodium thiosulphate consumed in the blank titration (ml); V is the volume of sodium thiosulphate consumed in the work experiment (mL); Titre T=0.3003 mg mL^{-1}

Results and discussion. According to the results of the study of the reaction kinetics, it was found that at pH 8.6-8.75 the interaction between FA and $KHSO_5$ occurs quantitatively and stoichiometrically for 3-5 min: 1 mole of FA consumes 1 mole of $KHSO_5$ (Fig.).

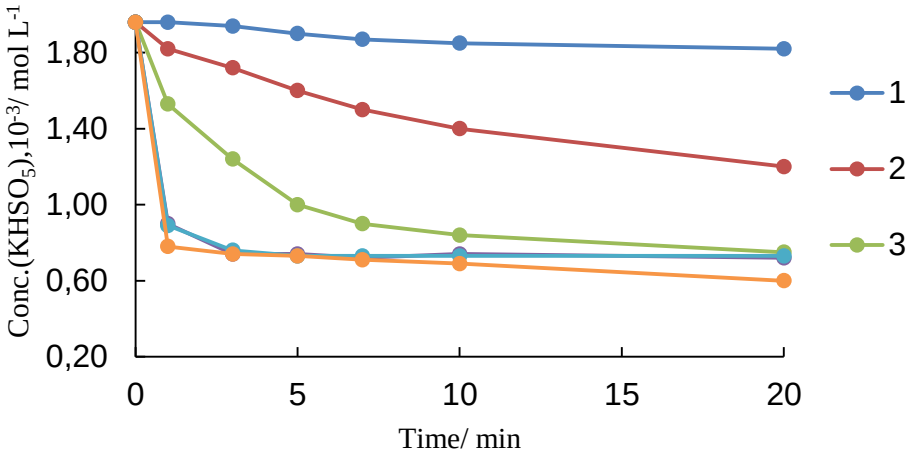

Fig. Kinetic curves of the formaldehyde oxidation reaction by $KHSO_5$.
c(FA) =1.24·10^{-3} mol L^{-1}; c($KHSO_5$) =(1.96)·10^{-3} mol L^{-1}. pH: *1* – 4.2; *2* – 6.1; *3* – 7.5; *4* – 8.6; *5* – 8.75; *6* – 9.5.

Methods for the quantitative determination of the content of the basic substance in the substance FA (Formalin) and the pharmaceutical preparation "Formidron" by the method of peroxoacidmetry (iodometric titration with control (reagent blank) experiment) were developed: at determination of 3.75 mg of formaldehyde RSD≤ 0.9%. The results are correct – they do not contain systematic error (δ<RSD). The advantage that differentiates it from the known ones is the absence of influence of related and auxiliary substances on the results of the analysis.

Conclusions. The obtained validation characteristics of the method for determining the content of formaldehyde in the drug "Formidron" meet the eligibility criteria for SPU, which indicates the possibility of its implementation in the practice of analysis of analytical laboratories.

IDENTIFICATION AND QUANTIFICATION OF PHENOLIC COMPOUNDS IN THE THICK EXRACT FOR THE TREATMENT OF DISEASES OF URINARY SYSTEM

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Introduction. Diseases of urinary system such as pyelonephritis, glomerulonephrithis, and cystitis form a big part of morbidity nowadays. The acute pathological processes can change into the