MINISTRY OF HEALTH OF UKRAINE

ODESSA NATIONAL MEDICAL UNIVERSITY

Faculty of Pharmacy

Department of Pharmaceutical Chemistry and Drug Technology

APPROVED by

Vice-rector for scientific and pedagogical work

_____Eduard BURYACHKIVSKY

_____, 202_

METHODOLOGICAL DEVELOPMENT TO THE INDEPENDENT WORK OF HIGHER EDUCATION ACQUIRES FROM EDUCATIONAL DISCIPLINE

Faculty, course Pharmaceutical, IV course

Academic discipline Pharmaceutical chemistry

(name of academic discipline)

Approved:

Department meeting Pharmaceutical chemistry and drug technology

Odessa National Medical University

Protocol No. _ dated _____.

Head of Department (_____) Volodymyr GELMBOLDT

(signature) *(First Name Last Name)*

Developers:

Senior Lecturer Nikitin O.V., assistant Lytvynchuk I.V., assistant Shishkin I.O.

Independent work No. 1

Topic: Agents affecting the afferent nervous system. Means that stimulate receptors of afferent nerve fibers.

The purpose:to acquaint students with the pharmaceutical analysis of drugs that stimulate receptors of afferent nerve fibers.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of agents affecting the afferent nervous system.
2. Characteristics of means that stimulate receptors of afferent nerve fibers.
3. Classification of agents affecting the afferent nervous system.
4. Classification of means that stimulate receptors of afferent nerve fibers.
5. Methods of analysis of agents affecting the afferent nervous system.
6. Methods of analysis of means that stimulate receptors of afferent nerve fibers.

Questions for self-control:

1. the relationship between the structure and the pharmacological action of agents affecting the afferent nervous system.
2. the mechanism of action of agents affecting the afferent nervous system.
3. methods of obtaining means affecting the afferent nervous system.
4. methods of analysis of agents affecting the afferent nervous system.
5. the use in medicine of means affecting the afferent nervous system.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

1. Calculate the volume of a 0.1M solution of sodium edetate (KP=1.0000), which will be spent on the titration of 0.9516 g of alkaline bismuth nitrate, if the percentage content of bismuth oxide (M.m. 465.66) in the substance is 80.0%.

2. Calculate the percentage content of magnesium oxide (M.m. 40.31) in alkaline magnesium carbonate, if 16.82 ml of 0.1M sodium edetate solution (KP=1.0002) was spent on the titration of a weight of 0.6782 g; the volume of the measuring flask is 100 ml, the volume of the pipette is 10 ml.

3. Calculate the volume of a 0.1 M solution of sodium edetate (KP = 1.0000) that will be used to titrate 0.5145 g of magnesium oxide (M.m. 40.31), if its percentage content in the substance is 96 .8%; the volume of the measuring flask is 100 ml, the volume of the pipette is 10 ml.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeAluminum hydroxide, Magnesium oxide, Basic magnesium carbonate, Basic bismuth nitratewith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationAluminum hydroxide, Magnesium oxide, Basic magnesium carbonate, Basic bismuth nitrate. Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationAluminum hydroxide, Magnesium oxide, Basic magnesium carbonate, Basic bismuth nitrate. Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 2

Topic: Means that reduce the sensitivity of afferent nerve fibers. Means for local anesthesia.

The purpose:to acquaint students with the pharmaceutical analysis of drugs that stimulate receptors of afferent nerve fibers.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of agents that reduce the sensitivity of afferent nerve fibers.
2. Characteristics of local anesthetic agents.
3. Classification of agents that reduce the sensitivity of afferent nerve fibers.
4. Classification of means for local anesthesia.
5. Methods of analysis of agents that reduce the sensitivity of afferent nerve fibers.
6. Methods of analysis of means for local anesthesia.

Questions for self-control:

1. the relationship between the structure and pharmacological action of agents that reduce the sensitivity of afferent nerve fibers.
2. the mechanism of action of agents that reduce the sensitivity of afferent nerve fibers.
3. methods of obtaining means that reduce the sensitivity of afferent nerve fibers.
4. methods of analysis of agents that reduce the sensitivity of afferent nerve fibers.
5. the use in medicine of means that reduce the sensitivity of afferent nerve fibers.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Calculate the percentage content of sodium benzoate (M.m. 144.11) in the substance, weighing 1.4963 g, 20.06 ml of a 0.5 M solution of hydrochloric acid (KP = 1.0000) was used, and the loss in weight during drying was 2 .5%.

Task 2.Suggest possible methods for the identification of terpine hydrate. Where possible, give equations for chemical reactions.

Task 3.Describe the quantitative determination of menthol by the acetylation method. Give the reaction equations, the formula for calculating the quantitative content, indicate the molar mass of the equivalent.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeTerpine hydrate, sodium benzoate, acetylcysteine, racemic mentholwith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationTerpine hydrate, sodium benzoate, acetylcysteine, racemic menthol. Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationTerpine hydrate, sodium benzoate, acetylcysteine, racemic menthol.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 3

Topic: Means affecting the efferent nervous system. Means acting on cholinergic processes. Means acting on cholinergic receptors. Cholinomimetics. Reversible anticholinesterase drugs. Irreversible anticholinesterase drugs.

The purpose:to acquaint students with the pharmaceutical analysis of medicinal products,affecting the efferent nervous system.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of the means,affecting the efferent nervous system.
2. Characteristics of means,acting on cholinergic processes.
3. Classification of means,affecting the efferent nervous system.
4. Classification of means,acting on cholinergic processes.
5. Methods of analysisanticholinesterase drugs of reversible action.
6. Methods of analysisanticholinesterase drugs of irreversible action.

Questions for self-control:

1. the relationship between the structure and the pharmacological action of the means,acting on cholinergic processes.
2. the mechanism of action of the means,acting on cholinergic processes.
3. methods of obtaining funds,acting on cholinergic processes.
4. methods of means analysis,acting on cholinergic processes.
5. use of medicinal products in medicine,acting on cholinergic processes.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1. Write a scheme for the synthesis of pilocarpine hydrochloride, name the compounds of the synthesis, give characteristics of individual stages.

Task 2. Quantitative determination of pilocarpine hydrochloride by FC. Name the method, explain the titration conditions, write the chemistry of reactions, indicator formulas, calculation of the equivalent and quantitative content in %.

Task 3. Write the structural formula, Latin and chemical names of pilocarpine hydrochloride, name the heterocycles that make up the molecule, write the chemistry of the butyrolactone detection reaction.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeBenzocaine, Procaine hydrochloride, Lidocaine hydrochloridewith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationBenzocaine, Procaine hydrochloride, Lidocaine hydrochloride.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationBenzocaine, Procaine hydrochloride, Lidocaine hydrochloride.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.
6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.
7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.
8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.
2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.
3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.
4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.
5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.
6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 4

Topic: Means affecting the efferent nervous system. Means acting on cholinergic processes. Cholinergic blockers (cholinelytics).

The purpose:to acquaint students with the pharmaceutical analysis of medicinal products,affecting the efferent nervous system.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of the means,affecting the efferent nervous system.
2. Characteristics of means,acting on cholinergic processes.
3. Classification of means,affecting the efferent nervous system.
4. Classification of means,acting on cholinergic processes.
5. Methods of analysisanticholinesterase drugs of reversible action.

6. Methods of analysisanticholinesterase drugs of irreversible action.

Questions for self-control:

1. the relationship between the structure and the pharmacological action of the means,acting on cholinergic processes.

2. the mechanism of action of the means,acting on cholinergic processes.

3. methods of obtaining funds,acting on cholinergic processes.

4. methods of means analysis,acting on cholinergic processes.

5. use of medicinal products in medicine,acting on cholinergic processes.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1. Calculate the percentage content of atropine sulfate (M.m. 676.8) in the substance, if the weight of the test piece is 0.4983 g, the volume of a 0.1 M perchloric acid solution (KP = 0.9892) in the working experiment is 7.42 ml, in the control - 0.21 ml, and the weight loss during drying - 2.3%.

Task 2. Calculate the volume of 0.1 M perchloric acid solution (KP = 1.0000), which is spent on the titration of 0.2014 g of scopolamine hydrobromide (M.m. 384.3), if the volume of the titrant in the control experiment is 0, 12 ml, the weight loss during drying is 12.6%, and the content of the active substance in the substance is 98.7%.

Task 3.Calculate the percentage content of tropacin (M.m. 371.91) in the substance, if the weight of the test piece is 0.1976 g, the volume of a 0.1 M perchloric acid solution (KP = 1.0014) in the working experiment is 5.43 ml , in the control - 0.18 ml, and the weight loss during drying is 0.4%.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemePilocarpine hydrochloride, Neostigmine methyl sulfate, Arminwith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationPilocarpine hydrochloride, Neostigmine methyl sulfate, Armin.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationPilocarpine hydrochloride, Neostigmine methyl sulfate, Armin.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 5

Topic: Means acting mainly on adrenergic processes.Adrenomimetics. Adrenoblockers (adrenolytics).

The purpose:to acquaint students with the pharmaceutical analysis of medicinal products,acting mainly on adrenergic processes.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of the means acting mainly on adrenergic processes
2. Classification of means acting mainly on adrenergic processes
3. Methods of analysisAdrenomimetics.
6. Methods of analysisAdrenoblockers.

Questions for self-control:

1. the relationship between the structure and the pharmacological effect of drugs acting mainly on adrenergic processes.
2. the mechanism of action of agents acting mainly on adrenergic processes.
3. methods of obtaining means acting mainly on adrenergic processes.
4. methods of analysis of means acting mainly on adrenergic processes.
5. the use in medicine of means acting mainly on adrenergic processes.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1. Calculate the weight of a test of norepinephrine hydrotartrate (M.m. 337.29), if 4.95 ml of a 0.1 M perchloric acid solution (CP = 1.0030) was spent on its titration, its percentage content in the substance is 99.5%, the percentage of water is 5% and the volume of the titrant in the control experiment is 0.30 ml.

Task 2. Calculate the percentage content of mesatone (M.m. 203.67) in the substance, if 16.10 ml of 0.1 M sodium thiosulfate solution (CP = 1.0000) was used for the titration of a weight of 0.1120 g when determined by the method of inverse bromatometry, weight loss during drying - 0.5% and the titrant volume in the control experiment - 48.50 ml.

Task 3.Write the structural formula, Latin and chemical name of ephedrine hydrochloride, properties, chemistry of pharmacopoeial identification reactions.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeEpinephrine, Norepinephrine, Phenylephrine hydrochloride, Ephedrine hydrochloride, Naphazoline nitrate, Clonidine hydrochloridewith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationEpinephrine, Norepinephrine, Phenylephrine hydrochloride, Ephedrine hydrochloride, Naphazoline nitrate, Clonidine hydrochloride.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationEpinephrine, Norepinephrine, Phenylephrine hydrochloride, Ephedrine hydrochloride, Naphazoline nitrate, Clonidine hydrochloride.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E.

Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 6

Topic: Cardiotonic means.

The purpose:to acquaint students with the pharmaceutical analysis of cardiotonic drugs.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of cardiotonic drugs.
2. Classification of cardiotonic drugs.
3. Methods of analysis of cardiotonic drugs.

Questions for self-control:

1. the relationship between the structure and pharmacological action of cardiotonic drugs.
2. mechanism of action of cardiotonic drugs.
3. methods of obtaining cardiotonic agents.
4. methods of analysis of cardiotonic drugs.
5. use of cardiotonic drugs in medicine.

Approximate tasks for processing the theoretical material:

− Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Describe the means of obtainingDigoxinfrom vegetable raw materials; its pharmacological action.

Task 2.Suggest possible identification methodsDigoxinin. Where possible, give equations for chemical reactions.

Task 3.Suggest possible identification methodsdopamine, dobutamine, amrinone.Where possible, give chemical equationsreactions

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeDigoxinin,Dopamine, Dobutaminewith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationDigoxinin,Dopamine, Dobutamine.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationDigoxinin,Dopamine, Dobutamine.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy

education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 7

Topic: Antiarrhythmic drugs.

The purpose:to acquaint students with the pharmaceutical analysis of antiarrhythmic drugs.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of antiarrhythmic drugs.
2. Classification of antiarrhythmic drugs.
3. Methods of analysis of antiarrhythmic drugs.

Questions for self-control:

1. the relationship between the structure and pharmacological action of antiarrhythmic drugs.
2. mechanism of action of antiarrhythmic drugs.
3. methods of obtaining antiarrhythmic drugs.
4. methods of analysis of antiarrhythmic agents.
5. use of antiarrhythmic drugs in medicine.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Give a scheme for the synthesis of novocainamide (procainamide hydrochloride), indicate the chemical names of starting, intermediate and final products; its pharmacological action.

Task 2.Suggest possible methods of identification of novocainamide (procainamide hydrochloride). Where possible, give the corresponding chemical reaction equations.

Task 3.Describe the nitritometric method for quantitative determination of novocainamide (procainamide hydrochloride). Give the reaction equations, the formula for calculating the quantitative content, indicate the molar mass of the equivalent.

Task 4.Calculate the percentage content of novocainamide (M.m. 271.79) in the substance, if 11.91 ml of 0.1 M sodium nitrite solution (KP = 1.0000) was used for the titration of a weight of 0.3120 g; the volume of the titrant in the control experiment is 0.52 ml.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeProcainamide hydrochloride, Amiodaronewith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationProcainamide hydrochloride, Amiodarone.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationProcainamide hydrochloride, Amiodarone.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 8

Topic: Means that improve blood supply to organs and tissues.

The purpose:to acquaint students with pharmaceutical analysis of agents that improve blood supply to organs and tissues.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of means that improve blood supply to organs and tissues.
2. Classification of means that improve blood supply to organs and tissues.
3. Methods of analysis of means that improve the blood supply of organs and tissues.

Questions for self-control:

1. the connection between the structure and the pharmacological action of means that improve the blood supply of organs and tissues.

2. the mechanism of action of agents that improve blood supply to organs and tissues.

3. methods of obtaining means that improve blood supply to organs and tissues.

4. methods of analysis of means that improve the blood supply of organs and tissues.

5. use in medicine of means that improve the blood supply of organs and tissues.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Suggest possible methods for the identification of glycerol. Where possible, give equations for chemical reactions.

Task 2.Describe possible physical and chemical methods for the quantitative determination of glycerol. Give the equations of the reactions, the formulas for calculating the quantitative content, indicate the molar masses of the equivalents.

Task 3.Methods of quantitative determination of nitroglycerin. Write reaction equations, formulas for calculating equivalents, quantitative content.

Task 4.Give a scheme for the synthesis of nitroglycerin, indicating the chemical names of the initial, intermediate and final products; its pharmacological action.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeGlycerin trinitrate solutionwith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationGlycerin trinitrate solution.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationGlycerin trinitrate solution.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.
2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.
3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.
4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.
5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.
6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.
7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.
8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 9

Topic: Peripheral vasodilators.

The purpose:to acquaint students with the pharmaceutical analysis of drugs - peripheral vasodilators.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of peripheral vasodilators.
2. Classification of peripheral vasodilators.
3. Methods of analysis of peripheral vasodilators.

Questions for self-control:

1. the relationship between the structure and pharmacological action of peripheral vasodilators.
2. the mechanism of action of peripheral vasodilators.
3. methods of obtaining peripheral vasodilators.
4. methods of analysis of peripheral vasodilators.
5. use of peripheral vasodilators in medicine.

Approximate tasks for processing the theoretical material:

− Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Suggest possible methods for the identification of glycerol. Where possible, give equations for chemical reactions.

Task 2.Describe possible physical and chemical methods for the quantitative determination of glycerol. Give the equations of the reactions, the formulas for calculating the quantitative content, indicate the molar masses of the equivalents.

Task 3.Methods of quantitative determination of nitroglycerin. Write reaction equations, formulas for calculating equivalents, quantitative content.

Task 4.Give a scheme for the synthesis of nitroglycerin, indicating the chemical names of the initial, intermediate and final products; its pharmacological action.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemePentaerythritol tetranitrate, Erinitawith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationPentaerythritol tetranitrate, Erinita.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationPentaerythritol tetranitrate, Erinita.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy

education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 10

Topic: Antagonists of calcium ions. Activators of potassium channels.

The purpose:to acquaint students with the pharmaceutical analysis of drugs - calcium ion antagonists, potassium channel activators.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of calcium ion antagonists.
2. Characteristics of potassium channel activators.
3. Classification of calcium ion antagonists.
4. Classification of potassium channel activators.
5. Methods of analysis of antagonists of calcium ions.
6. Methods of analysis of potassium channel activators.

Q

uestions for self-control:

1. the relationship between the structure and pharmacological action of calcium ion antagonists, calcium ion antagonists.
2. the mechanism of action of calcium ion antagonists, calcium ion antagonists.
3. methods of obtaining calcium ion antagonists, calcium ion antagonists.
4. methods of analysis of calcium ion antagonists, calcium ion antagonists.
5. use of calcium ion antagonists, calcium ion antagonists in medicine.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Antagonists of calcium ions. Activators of potassium channels. Characteristics, classification, relationship between structure and pharmacological action, mechanism of action, examples.

Task 2.Calculate the weight of the weightNifedipinein (M.m. 165.40), if 16.53 ml of a 0.1 M solution of hydrochloric acid (KP=1.0018) was spent on the titration, and its percentage content in the substance was 99.8%; volume of titrant in the control experiment - 34.60 ml.

Task 3.Calculate the volume of 0.1 M sodium hydroxide solution (KP=1.0000), which will be used for the titration of 0.1196 gVerapamil hydrochloridein (M.m. 140.19) by the reverse acidimeria method, if its percentage content in the substance is 99.2%; volume of titrant in the control experiment - 49.85 ml.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeNifedipine, Verapamil hydrochloride, Amlodipinewith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationNifedipine, Verapamil hydrochloride, Amlodipine.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationNifedipine, Verapamil hydrochloride, Amlodipine.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 11

Topic: Agents affecting the renin-angiotensin system.

The purpose:to acquaint students with the pharmaceutical analysis of drugs affecting the renin-angiotensin system.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of drugs affecting the renin-angiotensin system.
2. Classification of drugs affecting the renin-angiotensin system.
3. Methods of analysis of drugs affecting the renin-angiotensin system.
4. The use in medicine of drugs affecting the renin-angiotensin system.

Questions for self-control:

1. the relationship between the structure and pharmacological action of drugs affecting the renin-angiotensin system.
2. the mechanism of action of drugs affecting the renin-angiotensin system.
3. methods of obtaining medicinal products affecting the renin-angiotensin system.
4. methods of analysis of drugs affecting the renin-angiotensin system.
5. the use in medicine of drugs affecting the renin-angiotensin system.

Approximate tasks for processing the theoretical material:

− Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1. Write the structural formula, Latin and chemical name of dibazole, name and indicate the heterocycles and analytical functional groups that are in the molecule.

Task 2. Write and explain the chemistry of the identification reactions of papaverine hydrochloride with picrate acid, Dragendorff, Wagner-Buchard, Mayer, Marchi reagents, bromine water.

Task 3.Methods of quantitative determination of no-shpa (drotaverine hydrochloride).

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeCaptopril, Enalapril maleatewith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationCaptopril, Enalapril maleate.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationCaptopril, Enalapril maleate.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition.

- Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.
3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.
4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.
5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.
6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.
7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.
8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.
2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 12

Topic: Hypotensive (antihypertensive) drugs. Hypertensive drugs.

The purpose:to acquaint students with the pharmaceutical analysis of hypotensive (antihypertensive) agents, hypertensive agents.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of hypotensive (antihypertensive) drugs, hypertensive drugs.
2. Classification of hypotensive (antihypertensive) agents, hypertensive agents.
3. Methods of analysis of hypotensive (antihypertensive) agents, hypertensive agents.
4. Use of hypotensive (antihypertensive) agents, hypertensive agents in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of hypotensive (antihypertensive) agents, hypertensive agents.
2. the mechanism of action of hypotensive (antihypertensive) agents, hypertensive agents.
3. methods of obtaining hypotensive (antihypertensive) agents, hypertensive agents.
4. methods of analysis of hypotensive (antihypertensive) agents, hypertensive agents.
5. use of hypotensive (antihypertensive) agents, hypertensive agents in medicine.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Calculate the weight of a test of norepinephrine hydrotartrate (M.m. 337.29), if 4.95 ml of a 0.1 M perchloric acid solution (CP = 1.0030) was spent on its titration, its percentage content in the substance is 99.5%, the percentage of water is 5% and the volume of the titrant in the control experiment is 0.30 ml.

Task 2.Calculate the percentage content of mesatone (M.m. 203.67) in the substance, if 16.10 ml of 0.1 M sodium thiosulfate solution (CP = 1.0000) was used for the titration of a weight of 0.1120 g when determined by the method of inverse bromatometry, weight loss during drying - 0.5% and the titrant volume in the control experiment - 48.50 ml.

Task 3.Give a scheme for the synthesis of adrenaline hydrotartrate, indicating the chemical names of the starting compounds, intermediate and final products; its pharmacological action.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemePapaverine hydrochloride, Drotaverine hydrochloride, Dibazol with an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationPapaverine hydrochloride, Drotaverine hydrochloride, Dibazol.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationPapaverine hydrochloride, Drotaverine hydrochloride, Dibazol.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.
2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.
3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.
4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html
5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/
6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 13

Topic: Angioprotectors.

The purpose:to acquaint students with the pharmaceutical analysis of angioprotectors.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of angioprotectors.
2. Classification of angioprotectors.
3. Methods of analysis of angioprotectors.
4. Use of angioprotectors in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of angioprotectors.
2. mechanism of action of angioprotectors.
3. methods of obtaining angioprotectors.
4. methods of analysis of angioprotectors.
5. use of angioprotectors in medicine.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Calculate the volume of 0.1 M potassium iodate solution (KP = 1.0010), which will be used for the titration of 0.4520 g of ascorbic acid (M.m. 176.13), if its percentage content in the substance is 98.7% ; the volume of the measuring flask is 50 ml, the volume of the pipette is 10 ml.

Task 2.Calculate the volume of 0.1 M sodium hydroxide solution (KP = 1.0030), which will be spent on the titration of 0.3010 g of nicotinic acid (M.m. 123.11), if its percentage content in the substance is 99.5 % and weight loss during drying - 0.4%.

Task 3.Calculate the weight of the tocopherol acetate sample (M.m. 472.8), if 19.20 ml of a 0.1 M solution of cerium sulfate (KP = 1.0000) was spent on its titration, its percentage content in the substance was 94.9% and volume of titrant in the control experiment - 0.4 ml; the volume of the measuring flask is 50 ml, the volume of the pipette is 20 ml.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeAscorbic acid, Rutin, Nicotinic acid with an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationAscorbic acid, Rutin, Nicotinic acid.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationAscorbic acid, Rutin, Nicotinic acid.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html
5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/
6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 14

Topic: Antioxidants.

The purpose:to acquaint students with the pharmaceutical analysis of antioxidants.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of antioxidants.
2. Classification of antioxidants.
3. Methods of antioxidant analysis.
4. Use of antioxidants in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological effect of antioxidants.
2. the mechanism of action of antioxidants.
3. methods of obtaining antioxidants.
4. methods of antioxidant analysis.
5. use of antioxidants in medicine.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Calculate the volume of 0.1 M potassium iodate solution (KP = 1.0010), which will be used for the titration of 0.4520 g of ascorbic acid (M.m. 176.13), if its percentage content in the substance is 98.7% ; the volume of the measuring flask is 50 ml, the volume of the pipette is 10 ml.

Task 2.Calculate the volume of 0.1 M sodium hydroxide solution (KP = 1.0030), which will be spent on the titration of 0.3010 g of nicotinic acid (M.m. 123.11), if its percentage content in the substance is 99.5 % and weight loss during drying - 0.4%.

Task 3.Calculate the weight of the tocopherol acetate sample (M.m. 472.8), if 19.20 ml of a 0.1 M solution of cerium sulfate (KP = 1.0000) was spent on its titration, its percentage content in the substance was 94.9% and volume of titrant in the control experiment - 0.4 ml; the volume of the measuring flask is 50 ml, the volume of the pipette is 20 ml.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeTocopherol acetate, Retinol acetate with an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationTocopherol acetate, Retinol acetate.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationTocopherol acetate, Retinol acetate.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition.

- Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.
2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.
3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.
4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.
5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.
6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.
7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.
8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 15

Topic: Hypolipidemic agents.

The purpose:to acquaint students with the pharmaceutical analysis of hypolipidemic agents.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of hypolipidemic agents.
2. Classification of hypolipidemic agents.
3. Methods of analysis of hypolipidemic agents.
4. Use of hypolipidemic agents in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of hypolipidemic agents.
2. mechanism of action of hypolipidemic agents.
3. methods of obtaining hypolipidemic agents.
4. methods of analysis of hypolipidemic agents.
5. use of hypolipidemic agents in medicine.

Approximate tasks for processing the theoretical material:

− Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1. Write a synthesis schemelovastatin, simvastatin, atorvastatin, name analytical functional groups in molecules, write reactions for their detection. Application in medicine.

Task 2.Write and explain the chemistry of identification reactionslovastatin, simvastatin, atorvastatin.

Task 3.Quantitative definitionlovastatin, simvastatin, atorvastatin. Name the method, explain the titration conditions, write the chemistry of the reactions, formulas for calculating the equivalent and content in %.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeLovastatin, Simvastatin, Atorvastatin with an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationLovastatin, Simvastatin, Atorvastatin.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationLovastatin, Simvastatin, Atorvastatin.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy

education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 16

Topic: Diuretics.

The purpose:to acquaint students with the pharmaceutical analysis of diuretics.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of diuretics.
2. Classification of diuretics.
3. Methods of analysis of diuretics.
4. Use of diuretics in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of diuretics.

2. the mechanism of action of diuretics.

3. methods of obtaining diuretics.

4. methods of analysis of diuretics.

5. use of diuretics in medicine.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1. Write the structural formula, Latin and chemical names of furosemide, pharmacopoeial and non-pharmacopoeial identification reactions.

Task 2.Calculate the percentage content of furosemide, if the specific absorption index of the standard solution is 750, the optical density of the standard solution is 0.463, and the exact weight is 0.1011 g. The determination was made by FH.

Task 3.Calculate the exact weighthydrochlorothiazidefor quantitative determination by the spectrophotometric method, if the optical density is 0.434, the specific absorption index of the standard solution is 74.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeChlorthiazide, Hydrochlorothiazide, Furosemidewith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationChlorthiazide, Hydrochlorothiazide, Furosemide.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationChlorthiazide, Hydrochlorothiazide, Furosemide.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E.

Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 17

Topic: Agents affecting platelet aggregation and blood coagulation.

The purpose: to acquaint students with the pharmaceutical analysis of agents affecting platelet aggregation and blood coagulation.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of agents affecting platelet aggregation and blood coagulation.
2. Classification of agents affecting platelet aggregation and blood coagulation.
3. Methods of analysis of agents affecting platelet aggregation and blood coagulation.
4. Use in medicine of agents affecting platelet aggregation and blood coagulation.

Questions for self-control:

1. the relationship between the structure and the pharmacological effect of agents affecting platelet aggregation and blood coagulation.
2. the mechanism of action of agents affecting platelet aggregation and blood coagulation.
3. methods of obtaining agents affecting platelet aggregation and blood coagulation.
4. methods of analysis of agents affecting platelet aggregation and blood coagulation.
5. the use in medicine of agents affecting platelet aggregation and blood coagulation.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Calculate the volume of 0.1 M sodium hydroxide solution (KP=1.0000), which will be spent on the titration of 0.5120 g of acetylsalicylic acid (M.m. 180.16), if its percentage content in the substance is 99.6%.

Task 2.Calculate the percentage content of phenylsalicylate (M.m. 214.22) in the substance, if 15.60 ml of a 0.5M solution of hydrochloric acid (KP=1.0000) was spent on the titration of a weight of 0.9864g; the volume of the titrant in the control experiment is 24.76 ml.

Task 3.Write and explain the identification reactions of neodicumarin by analytical and functional groups.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeAcetylsalicylic acids,Neodicumarin, Heparin with an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationAcetylsalicylic acids,Neodicumarin.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationAcetylsalicylic acids,Neodicumarin.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition.

- Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.
2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.
3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.
4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.
5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.
6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.
7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.
8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 18

Topic: Antibiotics of heterocyclic structure. β-lactamase inhibitors.

The purpose:to acquaint students with pharmaceutical analysis of antibiotics of heterocyclic structure - β-lactamase inhibitors.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of heterocyclic structure antibiotics - β-lactamase inhibitors.
2. Classification of antibiotics of heterocyclic structure - β-lactamase inhibitors.
3. Methods of analysis of antibiotics of heterocyclic structure - β-lactamase inhibitors.
4. Application in medicine of antibiotics of heterocyclic structure - β-lactamase inhibitors.

Questions for self-control:

1. the relationship between the structure and pharmacological action of antibiotics of the heterocyclic structure - β-lactamase inhibitors.
2. the mechanism of action of antibiotics of heterocyclic structure - β-lactamase inhibitors.
3. methods of obtaining antibiotics of heterocyclic structure - β-lactamase inhibitors.
4. methods of analysis of antibiotics of heterocyclic structure - β-lactamase inhibitors.
5. use in medicine of antibiotics of heterocyclic structure - β-lactamase inhibitors.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1. Calculate the exact weight of oxacillin-sodium (M.m. 441.4), if 38.5 ml of 0.1 n was used for its titration according to FH. solution of hydrochloric acid (Kp 0.9973). The volume of the titrant in the control experiment. The content of the amount of penicillins is 94.5%.

Task 2.Calculate the percentage content of the amount of penicillins in phenoxymethylpenicillin when determining the amount of penicillins by the iodometric method, if the weight of the substance is 0.0685 g; volume of 0.01 M sodium thiosulfate solution (CP = 1.0000) in the main experiment - 11.48 ml; in the control experiment -19.80 ml; the value of the equivalent is 0.0004100; the volume of the measuring flask is 100 ml, the volume of the pipette is 5 ml.

Task 3.Calculate the weight of the weight of benzylpenicillin sodium salt, if 5.00 ml of 0.01 M sodium thiosulfate solution (KP = 1.0000) was spent on the titration of an excess of 0.01 M iodine solution (KP = 1.0000), the percentage content of the amount of penicillins is 99, 0%, titrant volume in the control experiment - 20.00 ml; the value of the equivalent is 0.0004000; the volume of the measuring flask is 100 ml, the volume of the pipette is 5 ml.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeantibiotics of heterocyclic structure - β-lactamase inhibitorswith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationantibiotics of heterocyclic structure - β-lactamase inhibitors.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationantibiotics of heterocyclic structure - β-lactamase inhibitors.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E.

Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 19

Topic: Tetracycline and macrolide antibiotics.

The purpose:to acquaint students with the pharmaceutical analysis of tetracycline and macrolide antibiotics.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of tetracycline and macrolide antibiotics.
2. Classification of tetracycline and macrolide antibiotics.
3. Methods of analysis of tetracycline and macrolide antibiotics.
4. Use of tetracycline and macrolide antibiotics in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of tetracycline and macrolide antibiotics.
2. mechanism of action of tetracycline and macrolide antibiotics.
3. methods of obtaining tetracycline and macrolide antibiotics.
4. methods of analysis of tetracycline and macrolide antibiotics.
5. use of tetracycline and macrolide antibiotics in medicine.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Calculate the volume of 0.1 M sodium nitrite solution (KP = 1.0000), which is used for the titration of 0.5025 g of chloramphenicol (M.m. 323.13), if its content in the substance is 98.5%.

Task 2.Calculate the percentage content of chloramphenicol (M.m. 323.13) in the substance, if 14.02 ml of 0.1 M sodium nitrite solution (CP = 1.0020) was spent on the titration of a weight of 0.4590 g.

Task 3.Write and explain the identification reactions of tetracyclines.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemetetracycline and macrolide antibioticswith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationtetracycline and macrolide antibiotics.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationtetracycline and macrolide antibiotics.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 20

Topic: Antibiotics of the aminoglycoside structure, amphenicols, other groups of antibiotics.

The purpose:to acquaint students with the pharmaceutical analysis of antibiotics of the aminoglycoside structure, amphenicols, and other groups of antibiotics.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of antibiotics of the aminoglycoside structure, amphenicols.
2. Classification of antibiotics of the aminoglycoside structure, amphenicols.

3. Methods of analysis of antibiotics of the aminoglycoside structure, amphenicols.

4. Use of antibiotics of the aminoglycoside structure, amphenicols in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of antibiotics of the aminoglycoside structure, amphenicols.

2. the mechanism of action of antibiotics of the aminoglycoside structure, amphenicols.

3. methods of obtaining antibiotics of the aminoglycoside structure, amphenicols.

4. methods of analysis of antibiotics of the aminoglycoside structure, amphenicols.

5. the use in medicine of antibiotics of the aminoglycoside structure, amphenicols.

Approximate tasks for processing the theoretical material:

− Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1. Calculate the exact dosage of furacilin (nitrofural)(M. m. 198.14), if 2.84 ml of 0.01 M solution of sodium thiosulfate (Kp 0.9800) was used for its titration according to FC. The volume of the titrant in the control experiment is 4.8 ml.

Task 2.Calculate the percentage content of furazolidone, if the specific absorption index of the standard solution is 750, the optical density of the standard solution is 0.463, and the exact weight is 0.1011 g. The determination was made by FH.

Task 3.Calculate the content of sodium chloride (M.m. 58.44) in furacilin tablets (nitrofural), if 13.5 ml of 0.1 n. silver nitrate solution (Kp 0.9996). The average weight of the tablet is 0.85 g.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeantibiotics of the aminoglycoside structure, amphenicolswith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationantibiotics of the aminoglycoside structure, amphenicols.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationantibiotics of the aminoglycoside structure, amphenicols.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html
5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/
6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 21

Topic: Sulfanilamides.

The purpose:to acquaint students with the pharmaceutical analysis of sulfonamides.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of sulfonamides.
2. Classification of sulfonamides.
3. Methods of analysis of sulfonamides.
4. Use of sulfonamides in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of sulfonamides.
2. mechanism of action of sulfonamides
3. methods of obtaining sulfonamides.
4. methods of analysis of sulfonamides.
5. use of sulfonamides in medicine.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1. Give a scheme for the synthesis of streptocide from acetanilide, indicating the chemical names of the initial, intermediate and final products; its pharmacological action.

Task 2.Specify the reasons for the contamination of soluble streptocide with an admixture of sodium sulfite. Give the reaction equation for the detection of this impurity.

Task 3.Describe possible methods of quantitative determination of soluble streptocide. Give the equations of the reactions, the formulas for calculating the quantitative content, indicate the molar masses of the equivalents.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeSulfanilamide, Sulfacetamide sodium (Albucid), Sulfatiazole (Norsulfazol), Phthalylsulfathiazole (Fthalazol)with an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationSulfanilamide, Sulfacetamide sodium (Albucid), Sulfatiazole (Norsulfazol), Phthalylsulfathiazole (Fthalazol).Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationSulfanilamide, Sulfacetamide sodium (Albucid), Sulphathiazole (Norsulfazol), Phthalylsulfathiazole (Fthalazol).Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 22

Topic: Derivatives of naphthyridine and quinolonecarboxylic acids.

The purpose:to acquaint students with the pharmaceutical analysis of naphthyridine derivatives and quinolone carboxylic acids.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of naphthyridine derivatives and quinolone carboxylic acids.
2. Classification of naphthyridine derivatives and quinolone carboxylic acids.
3. Methods of analysis of naphthyridine derivatives and quinolone carboxylic acids.
4. Use of naphthyridine derivatives and quinolone carboxylic acids in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of naphthyridine derivatives and quinolone carboxylic acids.
2. the mechanism of action of naphthyridine derivatives and quinolone carboxylic acids.
3. methods of obtaining naphthyridine derivatives and quinolone carboxylic acids.
4. methods of analysis of naphthyridine derivatives and quinolone carboxylic acids.
5. use of naphthyridine derivatives and quinolone carboxylic acids in medicine.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1. Calculate the percentage contentNorfloxacinin (M. m. 137,14), if for titration the so-called = 0.1173 g according to FC, 18.7 ml of 0.1 M sodium thiosulfate (Kp 1.0018) was used. The volume of the titrant in the control experiment is 50.5 ml.

Task 2.Calculate the volume of perchloric acid (Kp 1.0016), which will be used for titration of the so-called = 0.1828 gOfloxacinin (M. m. 271,28) according to FH. The content of ftivazide is 97.15%. For the titration of the control experiment, 0.08 ml was used, the loss of the substance during drying was 6.35%.

Task 3.Calculate the percentage contentOfloxacinin (M. m. 271.28), if 10.2 ml of 0.1 n. perchloric acid solution (Kp 1.0071). The volume of the titrant in the control experiment is 0.12 ml.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemederivatives of naphthyridine and quinolonecarboxylic acidswith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationderivatives of naphthyridine and quinolonecarboxylic acids.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationderivatives of naphthyridine and quinolonecarboxylic acids.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 23

Topic: Derivatives of 8-oxyquinoline, quinoxaline and nitrofuran.

The purpose:to acquaint students with the pharmaceutical analysis of 8-oxyquinoline, quinoxaline and nitrofuran derivatives.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of 8-oxyquinoline, quinoxaline derivatives.
2. Characteristics of nitrofuran derivatives.
3. Methods of analysis of 8-oxyquinoline, quinoxaline derivatives.
4. Methods of analysis of nitrofuran derivatives.

5. Use of 8-oxyquinoline, quinoxaline and nitrofuran derivatives in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of 8-oxyquinoline, quinoxaline and nitrofuran derivatives.

2. the mechanism of action of 8-oxyquinoline, quinoxaline and nitrofuran derivatives.

3. methods of obtaining 8-oxyquinoline, quinoxaline and nitrofuran derivatives.

4. methods of analysis of 8-oxyquinoline, quinoxaline and nitrofuran derivatives.

5. use of 8-oxyquinoline, quinoxaline and nitrofuran derivatives in medicine.

Approximate tasks for processing the theoretical material:

− Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1. Calculate the exact dosage of furacilin (nitrofural)(M. m. 198.14), if 2.84 ml of 0.01 M solution of sodium thiosulfate (Kp 0.9800) was used for its titration according to FC. The volume of the titrant in the control experiment is 4.8 ml.

Task 2.Calculate the percentage content of furazolidone, if the specific absorption index of the standard solution is 750, the optical density of the standard solution is 0.463, and the exact weight is 0.1011 g. The determination was made by FH.

Task 3.Calculate the content of sodium chloride (M.m. 58.44) in furacilin tablets (nitrofural), if 13.5 ml of 0.1 n. silver nitrate solution (Kp 0.9996). The average weight of the tablet is 0.85 g.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemederivatives of 8-oxyquinoline, quinoxaline and nitrofuranwith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationderivatives of 8-oxyquinoline, quinoxaline and nitrofuran.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationderivatives of 8-oxyquinoline, quinoxaline and nitrofuran.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 24

Topic: Antitubercular drugs.

The purpose:to acquaint students with the pharmaceutical analysis of anti-tuberculosis drugs.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of anti-tuberculosis agents.
2. Classification of antituberculosis agents.
3. Methods of analysis of anti-tuberculosis agents.
4. Use of anti-tuberculosis drugs in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of antituberculosis agents.
2. the mechanism of action of anti-tuberculosis drugs.
3. methods of obtaining anti-tuberculosis drugs.
4. methods of analysis of anti-tuberculosis agents.
5. use of anti-tuberculosis drugs in medicine.

Approximate tasks for processing the theoretical material:

− Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1. Calculate the percentage content of isoniazid (M. m. 137.14), if for titration the so-called = 0.1173 g according to FC, 18.7 ml of 0.1 M sodium thiosulfate (Kp 1.0018) was used. The volume of the titrant in the control experiment is 50.5 ml.

Task 2.Calculate the volume of perchloric acid (Kp 1.0016), which will be used for titration of the so-called = 0.1828 g of ftivazide (M. m. 271.28) according to FH. The content of ftivazide is 97.15%. For the titration of the control experiment, 0.08 ml was used, the loss of the substance during drying was 6.35%.

Task 3.Calculate the percent content of ftivazide (M. m. 271.28), if 10.2 ml of 0.1 N was used for the titration of an exact weight of 0.2518 g according to FH. perchloric acid solution (Kp 1.0071). The volume of the titrant in the control experiment is 0.12 ml.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeIsoniazid, Phtivazid, Sodium paraaminosalicylate with an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationIsoniazid, Phtivazid, Sodium paraaminosalicylate.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationIsoniazid, Phtivazid, Sodium paraaminosalicylate.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 25

Topic: Medicinal products used for the treatment of oncological diseases (alkaloids, antibiotics, hormonal agents and their antagonists, other groups).

The purpose:to acquaint students with the pharmaceutical analysis of drugs used for the treatment of oncological diseases.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of medicinal products used for the treatment of oncological diseases.
2. Classification of drugs used for the treatment of oncological diseases.
3. Methods of analysis of medicinal products used for the treatment of oncological diseases.
4. Application in medicine of drugs used for the treatment of oncological diseases.

Questions for self-control:

1. the relationship between the structure and the pharmacological effect of drugs used for the treatment of oncological diseases.
2. the mechanism of action of the means used for the treatment of oncological diseases.
3. methods of obtaining drugs used for the treatment of oncological diseases.
4. methods of analysis of means used for the treatment of oncological diseases.
5. use in medicine of means used for the treatment of oncological diseases.

Approximate tasks for processing the theoretical material:

− Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1. Calculate the exact weight of prednisolone tablets for quantitative determination by FH, if the optical density of the solution under study is 0.558, the average weight of the tablet is 0.2510 g.

Task 2.Calculate the volume of 0.1 M perchloric acid solution (KP = 1.0000), which is spent on the titration of 0.2014 g of scopolamine hydrobromide (M.m. 384.3), if

the volume of the titrant in the control experiment is 0, 12 ml, the weight loss during drying is 12.6%, and the content of the active substance in the substance is 98.7%.

Task 3.Calculate the percentage content of tropacin (M.m. 371.91) in the substance, if the weight of the test piece is 0.1976 g, the volume of a 0.1 M perchloric acid solution (KP = 1.0014) in the working experiment is 5.43 ml , in the control - 0.18 ml, and the weight loss during drying is 0.4%.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schememeans used for the treatment of oncological diseasesparaaminosalicylate with an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationmeans used for the treatment of oncological diseases.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationmeans used for the treatment of oncological diseases.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition.

- Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 26

Topic: Examples of "targeted" anticancer drugs (drugs of different chemical groups).

The purpose:to acquaint students with the pharmaceutical analysis of "targeted" anticancer drugs.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of anticancer drugs.

2. Classification of anticancer drugs.

3. Methods of analysis of anticancer drugs.

4. Use of anticancer drugs in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of anticancer drugs.

2. the mechanism of action of anticancer drugs.

3. methods of obtaining anticancer drugs.

4. methods of analysis of anticancer drugs.

5. use of anticancer drugs in medicine.

Approximate tasks for processing the theoretical material:

− Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Calculate the percentage content of novembiquine (M.m. 223.08) in the substance, if 13.14 ml of 0.1M ammonium rhodanide solution (KP=1.0000) was used for the titration of a weight of 0.2649 g, and the titrant volume in the control experiments - 24.76.

Task 2.Calculate the mass of the sarcolysin sample (M.m. 102.90), if 19.23 ml of 0.1 M silver nitrate solution (KP=0.9870) was spent on its titration; its percentage content in the substance is 99.4%.

Task 3.Calculate the volume of a 0.1 M solution of ammonium rhodanide (KP = 0.9950), which will be used for the titration of 0.2876 g of cyclophosphamide (M.m. 169.87), if its percentage content in the substance is 99.8% .

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1. Give a scheme for the synthesis of novembihin with an indication of the chemical names of the initial, intermediate and final products; its pharmacological action.

2.Describe possible methods for quantification of novembiquin. Give the reaction equations, the formula for calculating the quantitative content, indicate the molar mass of the equivalent.

3. Write the structural formula, Latin and chemical names of sarcolysin, synthesis scheme, identification reactions by analytical functional groups, applications.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html
5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/
6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 27

Topic: Antiviral means.

The purpose:to acquaint students with the pharmaceutical analysis of antiviral agents.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of antiviral agents.
2. Classification of antiviral agents.
3. Methods of analysis of antiviral agents.
4. Use of antiviral agents in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of antiviral agents.
2. the mechanism of action of antiviral agents.
3. methods of obtaining antiviral agents.
4. methods of analysis of antiviral agents.
5. use of antiviral agents in medicine.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Calculate the volume of 0.1 M perchloric acid solution (KP = 1.0000), which will be spent on the titration of 0.1450 g of rimantadine (Mm. 205.64), if its percentage content in the substance is 98.7%, loss in weight during drying - 0.45%, and the volume of the titrant in the control experiment - 0.3 ml.

Task 2.Calculate the percentage content of glutanthane (M.m. 397.36) in the substance, if the weight of the test piece is 0.2517 g, the volume of a 0.1 M perchloric acid solution (KP = 0.9916) in the working experiment is 6.19 ml , in the control - 0.18 ml. weight loss during drying - 6.5%.

Task 3.Calculate the weight of the rimantadine sample (Mm. 205.64), if 4.95 ml of a 0.1 M perchloric acid solution (CP = 1.0030) was spent on its titration, its percentage in the substance is 99.5%, the percentage is water - 5% and the titrant volume in the control experiment - 0.30 ml.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1. Give a scheme for the synthesis of antiviral agents, indicating the chemical names of the initial, intermediate and final products; its pharmacological action.

2.Describe possible methods of quantitative determination of antiviral agents. Give the reaction equations, the formula for calculating the quantitative content, indicate the molar mass of the equivalent.

3. Write the structural formula, Latin and chemical names of antiviral agents, synthesis scheme, identification reactions by analytical functional groups, applications.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition.

- Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.
2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.
3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.
4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.
5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.
6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.
7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.
8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 28

Topic: Antimalarial drugs.

The purpose:to acquaint students with the pharmaceutical analysis of antimalarial drugs.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of antimalarial drugs.
2. Classification of antimalarial drugs.
3. Methods of analysis of antimalarial drugs.
4. Use of antimalarial drugs in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of antimalarial drugs.
2. the mechanism of action of antimalarial drugs.
3. methods of obtaining antimalarial drugs.
4. methods of analysis of antimalarial agents.
5. use of antimalarial drugs in medicine.

Approximate tasks for processing the theoretical material:

− Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Calculate the percentage content of potassium chloride (M.m. 74.56) in the substance, if 13.02 ml of 0.1 M silver nitrate solution (KP=1.0100) was spent on the titration of a weight of 0.9850 g; the volume of the measuring flask is 50 ml, the volume of the pipette is 5 ml.

Task 2.Calculate the weight of sodium bromide (M.m. 102.90), if 19.23 ml of 0.1 M silver nitrate solution (KP=0.9870) was spent on its titration; its percentage content in the substance is 99.4%.

Task 3.Calculate the volume of a 0.1 M solution of silver nitrate (KP=1.0008), which will be spent on the titration of 0.3145 g of potassium iodide (M.m. 166.01), if its percentage content in the substance is 99.7% .

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeantimalarial drugswith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationantimalarial drugs.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationantimalarial drugs.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition.

- Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320 p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 29

Topic: Medicines for the treatment of protozoan infections.

The purpose:to acquaint students with the pharmaceutical analysis of drugs for the treatment of protozoan infections.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of drugs for the treatment of protozoan infections.
2. Classification of drugs for the treatment of protozoan infections.

3. Methods of analysis of medicinal products for the treatment of protozoan infections.

4. Application in medicine of drugs for the treatment of protozoan infections.

Questions for self-control:

1. the relationship between the structure and pharmacological action of drugs for the treatment of protozoan infections.

2. the mechanism of action of drugs for the treatment of protozoan infections.

3. methods of obtaining medicines for the treatment of protozoan infections.

4. methods of analysis of medicinal products for the treatment of protozoan infections.

5. use in medicine of drugs for the treatment of protozoan infections.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Calculate the weight of potassium permanganate (M.m. 158.04), if 23.68 ml of 0.1 M sodium thiosulfate solution (KP=1.0000) was spent on its titration by the method of indirect iodometry; its percentage content in the substance is 99.8%; the volume of the measuring flask is 100 ml, the volume of the pipette is 25 ml.

Task 2.Calculate the percentage content of hydrogen peroxide (M.m. 34.01) in the solution, if 18.40 ml of 0.1 M potassium permanganate solution (KP=1.0018) was spent on the preparation of 10.00 ml of the drug; the volume of the measuring flask is 100 ml, the volume of the pipette is 10 ml.

Task 3.Calculate the volume of 0.1 M sodium thiosulfate solution (KP = 1.0012), which will be spent on the titration of 0.2016 g of iodine (atm. 126.90), if its percentage content in the substance is 99.6%.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemedrugs for the treatment of protozoan infectionswith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationdrugs for the treatment of protozoan infections.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationdrugs for the treatment of protozoan infections.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 30

Topic: Anthelmintics.

The purpose:to acquaint students with the pharmaceutical analysis of anthelmintics.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of anthelmintics.
2. Classification of anthelmintic agents.
3. Methods of analysis of anthelmintic agents.
4. Use of anthelmintics in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of anthelmintics.
2. the mechanism of action of anthelmintics.
3. methods of obtaining anthelmintics.
4. methods of analysis of anthelmintics.
5. use of anthelmintics in medicine.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Calculate the percentage content of potassium iodide (M.m. 166.01) in a 5% alcoholic solution of iodine, if 8.04 ml of a 0.1M solution of argentum nitrate (KP = 1.0000) was spent on the titration of 2.00 ml of the drug; volume of 0.1 M sodium thiosulfate solution (CP = 1.0000), spent on iodine titration - 5.68 ml.

Task 2.Calculate the weight of magnesium peroxide (M.m. MgO2 56.31), if 18.08 ml of 0.1 M potassium permanganate solution (KP = 0.9960) was spent on its titration, and its percentage content in the substance is 25.2 %.

Task 3.Calculate the volume of 0.1 M iodine solution (KP = 1.0006), which will be spent on the titration of 0.4890 g of sodium thiosulfate (M.m. 248.18), if its percentage content in the substance is 101.0%.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeanthelminticswith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationanthelmintics.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationanthelmintics.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 31

Topic: Antifungal drugs.

The purpose:to acquaint students with the pharmaceutical analysis of antifungal drugs.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of antifungal drugs.
2. Classification of antifungal drugs.
3. Methods of analysis of antifungal drugs.
4. Use of antifungal drugs in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of antifungal drugs.
2. the mechanism of action of antifungal drugs.
3. methods of obtaining antifungal drugs
4. methods of analysis of antifungal drugs.
5. use of antifungal drugs in medicine.

Approximate tasks for processing the theoretical material:

− Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Calculate the percentage content of sodium nitrite (M.m. 69.00) in the substance, if 14.00 ml of 0.1 M sodium thiosulfate solution (KP=1.0030) was spent

on the titration of a weight of 0.9006 g; volume of titrant in the control experiment - 39.00 ml; the volume of the measuring flask is 100 ml, the volume of the pipette is 10 ml.

Task 2.Calculate the weight of the arsenic anhydride test (M.m. 197.84), if 20.35 ml of 0.1 M potassium bromate solution (KP = 0.9998) was spent on its titration; its percentage content in the substance is 99.4%; the volume of the titrant in the control experiment is 0.60 ml.

Task 3.Calculate the volume of a 0.1M solution of sodium edetate (KP=1.0000), which will be spent on the titration of 0.9516 g of alkaline bismuth nitrate, if the percentage content of bismuth oxide (M.m. 465.66) in the substance is 80, 0%

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeantifungal drugswith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationantifungal drugs.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationantifungal drugs.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition.

- Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.
3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.
4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.
5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.
6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.
7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.
8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.
2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 32

Topic: Antipediculosis and acaricidal means.

The purpose:to acquaint students with the pharmaceutical analysis of antipediculosis and acaricidal agents.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of antipediculosis and acaricidal agents.
2. Classification of antipediculosis and acaricidal agents.
3. Methods of analysis of antipediculosis and acaricidal agents.
4. Use of antipediculosis and acaricidal agents in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of antipediculosis and acaricidal agents.
2. the mechanism of action of antipediculosis and acaricidal agents.
3. methods of obtaining antipediculosis and acaricidal agents.
4. methods of analysis of antipediculosis and acaricidal agents.
5. use of antipediculosis and acaricidal agents in medicine.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Calculate the percentage of sodium hydrogen carbonate (M.m. 84.01) in the substance, if 20.34 ml of a 0.5M solution of hydrochloric acid (KP=1.0000) was spent on the titration of a weight of 0.8590 g.

Task 2.Calculate the volume of a 0.1M solution of hydrochloric acid (KP=0.9880), which will be spent on the titration of 0.5050 g of sodium tetraborate (M.m. 381.37), if its percentage content in the substance is 100.1% .

Task 3.Calculate the weight of copper sulfate (M.m. 249.68), if 20.42 ml of 0.1 M sodium thiosulfate solution (KP = 1.0000) was used for its titration, and its percentage content in the substance is 96.6% .

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeantipediculosis and acaricidal meanswith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationantipediculosis and acaricidal means.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationantipediculosis and acaricidal means.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html

Independent work No. 33

Topic: Antiseptic and disinfectants.

The purpose:to acquaint students with the pharmaceutical analysis of antiseptics and disinfectants.

Basic concepts: State Pharmacopoeia of Ukraine, qualitative analysis, quantitative analysis, active substance, substance, monograph.

Plan

1. Theoretical questions:

1. Characteristics of antiseptics and disinfectants.
2. Classification of antiseptics and disinfectants.
3. Methods of analysis of antiseptics and disinfectants.
4. Use of antiseptic and disinfectants in medicine.

Questions for self-control:

1. the relationship between the structure and pharmacological action of antiseptic and disinfectants.
2. the mechanism of action of antiseptics and disinfectants.
3. methods of obtaining antiseptic and disinfectants.
4. methods of analysis of antiseptics and disinfectants.
5. use of antiseptics and disinfectants in medicine.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

Task 1.Calculate the weight of zinc sulfate (M.m. 287.54), if 20.72 ml of 0.1M sodium edetate solution (KP=1.0000) was spent on its titration, and its percentage content in the substance is 99.8%.

Task 2.Calculate the volume of a 0.1 M solution of ammonium rhodanide (KP = 0.9950), which will be used to titrate 0.2876 g of argentum nitrate (M.m. 169.87), if its percentage content in the substance is 99.8 %.

Task 3.Calculate the percentage content of phenylsalicylate (M.m. 214.22) in the substance, if 15.60 ml of a 0.5M solution of hydrochloric acid (KP=1.0000) was spent on the titration of a weight of 0.9864g; the volume of the titrant in the control experiment is 24.76 ml.

3. Test tasks for self-control:

Test tasks are attached.

4. Individual tasks for students of higher education on the topic:

1.Give a synthesis schemeantiseptic and disinfectantswith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationantiseptic and disinfectants.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationantiseptic and disinfectants.Give the relevant reaction equations, the equivalent value and the formula for calculating the quantitative content.

5. List of recommended literature:

Main:

1. State Pharmacopoeia of Ukraine: in 3 volumes / Derz. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2015. - Vol. 1. - 1128 p.

2. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 2. - 724 p.

3. State Pharmacopoeia of Ukraine: in 3 volumes / Derzh. medical service of Ukraine funds, Ukr. of science pharmacopoeia medicine quality center means - 2nd edition. - Kh.: Ukr. of science pharmacopoeia medicine quality center means, 2014. - Vol. 3. - 732 p.5.

4. Pharmaceutical chemistry: Textbook for students. higher pharmacy education closing and pharmacy Faculty of Medical Sciences for students higher pharmacy education closing / In general ed. P.O. Bezuglio - Kind. 3rd edition, revised. – Vinnytsia, NOVA KNYGA, 2017. - 456 p.

5. Nizhnyk H.P. Pharmaceutical chemistry: a textbook (University I-III years) H.P. Nizhnyk — 2nd ed., ed. - All-Ukrainian specialized publishing house "Medytsina", 2015. - 352 p.

6. Pharmaceutical chemistry. Analysis of medicinal substances by functional groups: study guide / O.O. Tsurkan, I.V. Nizhenkovska, O.O. Glushachenko. - 3rd edition - All-Ukrainian specialized publishing house "Medytsina", 2019. - 152 p.

7. Hudoyarova O.S. Pharmaceutical chemistry. - Vinnytsia: "Nilan-LTD" LLC, 2018. - 194 p.

8. Analytical chemistry: teaching. reference manual for students higher education closing / V. V. Bolotov, O. A. Yevtifeeva, T. V. Zhukova, L. Yu. Klymenko, O. E. Mykytenko, V. P. Moroz, I. Yu. Petukhova; in general ed. V. V. Bolotova. - Kh.: NFaU, 2014. - 320p.

Additional:

1. Medicinal chemistry: education. manual for students of higher educational institutions / I.S. Hrytsenko, S.G. Taran, L.O. Transition, etc.; for general I.S. Hrytsenko - Kharkiv: NFaU: Golden Pages, 2017. - 552p.

2. Pharmaceutical chemistry. General and special pharmaceutical chemistry. Medicines of an inorganic nature: laboratory-practical classes. Study guide / L.G. Mishina - Vinnytsia: PP "TD "Edelweiss and K"", 2010. - 384 p.

3. Analytical chemistry and instrumental methods of analysis / A.I. Gab, D.B. Shakhnin, V.V. Malyshev -Ukraine University, 2018- 396 p.

4. British Pharmacopoeia, 2004. - CD-ROM, v. 3.0.

5. European Pharmacopoeia. Third Edition. Supplement, 2008. Council of Europe Strasbourg.

6. Clarke's Analysis of Drugs and Poisons, London: Pharmaceutical Press, Electronic version, 2005.

Electronic information resources:

1. Specialized medical online publication for doctors, pharmacists, pharmacists, students of medical and pharmaceutical universities. - [Electronic resource]. - Access mode:http://www.morion.ua.

2. World Health Organization. - [Electronic resource]. - Access mode:http://www.who.int.

3. Pharmaceutical encyclopedia. - [Electronic resource]. – Access mode: http://www.pharmencyclopedia.com.ua.

4. Official website of the International Organization for Standardizationhttp://www.iso.org/iso/home.html

5. Compendium online. [Electronic resource]. - Access mode:https://compendium.com.ua/bad/

6. Medline search database [Electronic resource]. – Access mode: National Library of Medicinehttps://www.nlm.nih.gov/bsd/medline.html