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 THE STUDENT FROM EDUCATIONAL DISCIPLINE

Faculty, course Pharmaceutical, V course

Educational discipline Pharmaceutical chemistry

(the name of the educational discipline)

Approved:

The meeting of the department Pharmaceutical chemistry

Odesa National Medical University

Minutes № _ dated _____

Head of Department (_____) Volodymyr GELMBOLDT
(signature) *(Name, last name)*

Developers:

Senior Lecturer Nikitin O.V., as. Lytvynchuk I.V., as. Shyshkin I.O.

Independent work No. 1

Topic: Medicines for thyroid hormones, antithyroid drugs.

Goal: to acquaint students with the pharmaceutical analysis of medicinesthyroid hormones,antithyroid drugs.

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

Plan

1. Theoretical questions:

1. Characteristics of thyroid hormones.
2. Characteristics of antithyroid drugs.
3. Classification of thyroid hormones.
4. Classification of antithyroid drugs.
5. Methods of analysis of thyroid hormones.
6. Methods of analysis of antithyroid drugs.

Questions for self-control:

1. the relationship between the structure and the pharmacological action of the meansthyroid hormones,antithyroid drugs.
2. the mechanism of action of the meansthyroid hormones,antithyroid drugs.
3. methods of obtaining fundsthyroid hormones,antithyroid drugs.
4. methods of means analysisthyroid hormones,antithyroid drugs.
5. use of means in medicinethyroid hormones,antithyroid drugs.

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 0.1 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% .

2.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.

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 schemethyroxine, triiodothyronine, thyroidin, iodine, mercazolyl (thiamazole)with an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationthyroxine, triiodothyronine, thyroidin, iodine, mercazolyl (thiamazole). Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationthyroxine, triiodothyronine, thyroidin, iodine, mercazolyl (thiamazole). 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: Pancreatic hormone drugs.

Goal:to acquaint students with the pharmaceutical analysis of medicinesthyroid hormones.

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

Plan

1. Theoretical questions:

1. Characteristics of medicinesthyroid hormones.
2. Classification of medicinesthyroid hormones.

3. Methods of drug analysisthyroid hormones.

Questions for self-control:

1. the relationship between the structure and pharmacological action of drugsthyroid hormones.
2. mechanism of action of medicinesthyroid hormones.
3. methods of obtaining medicinesthyroid hormones.
4. methods of drug analysisthyroid hormones.
5. use of medicines in medicinethyroid hormones.

Approximate tasks for processing the theoretical material:

- Compile a dictionary of basic concepts on the topic.

2. Practical works (tasks) to be performed:

1. Comparative characteristicsdrugs of pancreatic hormones.Characteristics, classification, relationship between structure and pharmacological action, mechanism of action, examples

2.Characterization, classification, pharmaceutical analysis of pancreatic hormone drugs.

3. Characterizethe relationship between the structure and pharmacological action, the mechanism of action of drugs of pancreatic hormones.

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 schemeInsulin:Insulin for injection, Suinsulin, Zinc-insulin suspension for injectionwith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationInsulin:Insulin for injections, Suinsulin, Zinc-insulin suspensions. Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationInsulin:Insulin for injections, Suinsulin, Zinc-insulin suspensions.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.

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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.

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

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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: Antidiabetic drugs.

Goal: to acquaint students with pharmaceutical analysisantidiabetic drugs.

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

Plan

1. Theoretical questions:

1. Characteristicsantidiabetic drugs.
2. Classificationantidiabetic drugs.
3. Methods of analysisantidiabetic drugs.

Questions for self-control:

1. the relationship between structure and pharmacological actionantidiabetic drugs.
2. mechanism of actionantidiabetic drugs.
3. methods of obtainingantidiabetic drugs.
4. methods of analysisantidiabetic drugs.
5. application in medicineantidiabetic drugs.

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 butamide, indicating the chemical names of the initial, intermediate and final products; its pharmacological action.

Task 2. Suggest possible methods of identification of butamide, chlorpropamide. Where possible, give equations for chemical reactions.

Task 3.Describe the alkalimetric method of quantitative determination of butamide. 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 schemeButamide, Chlorpropamide, Bucarban, Glibenclamide,Metformin hydrochloride, Buforminwith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationButamide, Chlorpropamide, Bucarban, Glibenclamide.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationButamide, Chlorpropamide, Bucarban, Glibenclamide.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.

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Additional:

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

Independent work No. 4

Topic: Steroid hormones and their analogues.

Goal:to acquaint students with the pharmaceutical analysis of drugs from the group of steroid hormones and their analogues.

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

Plan

1. Theoretical questions:

1. Characteristics of drugs from the group of steroid hormones and their analogues.
2. Classification of drugs from the group of steroid hormones and their analogues.
3. Methods of analysis of drugs from the group of steroid hormones and their analogues.

Questions for self-control:

1. the relationship between the structure and pharmacological action of drugs from the group of steroid hormones and their analogues.
2. the mechanism of action of drugs from the group of steroid hormones and their analogues.
3. methods of obtaining drugs from the group of steroid hormones and their analogues.
4. methods of analysis of drugs from the group of steroid hormones and their analogues.
5. use in medicine of drugs from the group of steroid hormones and their analogues.

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. 1.Calculate the specific rotation of 1% pure testosterone propionate, the angle of rotation is +0.9°. The thickness of the cuvette is 1 dm.

Task 2. Calculate the specific rate of absorption of 0.005% alcoholic solution of ethinyl estradiol. The optical density is 0.36.

Task 3.Calculate the percentage content of sinestrol (M. m. 270.37), if the so-called titration = 0.4700 g according to FH used 3.95 ml of 0.5 n. NaOH solution (Kp 1.0075). The volume of the titrant in the control experiment is 10.3 ml.

3. Test tasks for self-control:

Test tasks are attached.

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

1.Give the general synthesis schememedicines from the group of steroid hormones and their analogueswith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose general methods of identificationmedicines from the group of steroid hormones and their analogues.Where possible, give chemical equationsreactions

3.Describe general methodsmedicines from the group of steroid hormones and their analogues.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.

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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.

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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.

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Electronic information resources:

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

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

Independent work No. 5

Topic: Hormones of the adrenal cortex and their synthetic analogues. Corticosteroids.

Goal:to acquaint students with the pharmaceutical analysis of drugs from the groupadrenal cortex hormones and their synthetic analogues.

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

Plan

1. Theoretical questions:

1. Characteristics of corticosteroids.
2. Classification of drugs from the groupadrenal cortex hormones and their synthetic analogues.
3. Methods of analysis of drugs from the groupadrenal cortex hormones and their synthetic analogues.

Questions for self-control:

1. the relationship between the structure and pharmacological action of corticosteroids.
2. the mechanism of action of agents acting mainly on adrenergic processes.
3. methods of obtaining corticosteroids.
4. methods of corticosteroid analysis.
5. use of corticosteroids 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 content of cortisone acetate in a tablet taken for quantitative determination by FH, if the optical density of the test solution is 0.505, the average weight of the tablet is 0.195 g, and the exact weight of the tablet powder is 0.0990.

Task 2. 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 3.Calculate the percentage content of retinyl acetate according to FC. The optical density of the investigated solution is 0.45, the exact weight is 0.0287 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 schemeDeoxycorticosterone acetate, Cortisone acetate, Hydrocortisone acetate, Prednisone, Dexamethasone, Triamcinolone, Flumethasone pivalatewith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationDeoxycorticosterone acetate, Cortisone acetate, Hydrocortisone acetate, Prednisolone, Dexamethasone, Triamcinolone, Flumethasone pivalate.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationDeoxycorticosterone acetate, Cortisone acetate, Hydrocortisone acetate, Prednisolone, Dexamethasone, Triamcinolone, Flumethasone pivalate.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.

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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: Androgens, anabolic steroids and their analogues.

Goal:to acquaint students with the pharmaceutical analysis of drugs from the groupandrogens, anabolic steroids and their analogues.

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

Plan

1. Theoretical questions:

1. Characteristics of drugs from the groupandrogens, anabolic steroids and their analogues.
2. Classification of drugs from the groupandrogens, anabolic steroids and their analogues.
3. Methods of medicines from the groupandrogens, anabolic steroids and their analogues.

Questions for self-control:

1. the relationship between the structure and pharmacological effect of drugs from the groupandrogens, anabolic steroids and their analogues.
2. mechanism of action of drugs from the groupandrogens, anabolic steroids and their analogues.
3. methods of obtaining medicines from the groupandrogens, anabolic steroids and their analogues.
4. methods of analysis of drugs from the groupandrogens, anabolic steroids and their analogues.
5. use in medicine of medicines from the groupandrogens, anabolic steroids and their analogues.

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 specific rotation of 1% pure testosterone propionate, the angle of rotation is +0.9°. The thickness of the cuvette is 1 dm.

Task 2.Calculate the angle of rotation of a 1% methandrostenolone solution if the specific rotation is +4.5°. The thickness of the cuvette is 19 mm.

Task 3.Calculate the specific rotation of a 1% methylandrostenediol solution if the angle of rotation is -0.7. The thickness of the cuvette is 19 mm.

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 schemeTestosterone propionate, Methyltestosterone, Methandienone, Nandrolone phenylpropionatewith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationTestosterone propionate, Methyltestosterone, Methandienone, Nandrolone phenylpropionate.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationTestosterone propionate, Methyltestosterone, Methandienone, Nandrolone phenylpropionate.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: Progestogens, estrogens. Birth control. Estrogens of nonsteroidal structure.

Goal:to acquaint students with the pharmaceutical analysis of drugs from the groupprogestogens, estrogens.

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

Plan

1. Theoretical questions:

1. Characteristics of drugs from the groupprogestogens, estrogens.
2. Classification of drugs from the groupprogestogens, estrogens.
3. Methods of analysis of drugs from the groupprogestogens, estrogens.

Questions for self-control:

1. the relationship between the structure and pharmacological effect of drugs from the groupprogestogens, estrogens.
2. mechanism of action of drugs from the groupprogestogens, estrogens.
3. methods of obtaining medicines from the groupprogestogens, estrogens.
4. methods of analysis of drugs from the groupprogestogens, estrogens.
5. use in medicine of medicines from the groupprogestogens, estrogens.

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 pregnin tablets for quantitative determination by FH, if the optical density of the test solution is 1.02, the average weight of the tablet is 0.1 g, and the exact weight of the powder of the tablets is 0.0986 g.

Task 2. Calculate the percentage content of sinestrol (M. m. 270.37), if the so-called titration = 0.4700 g according to FH used 3.95 ml of 0.5 n. NaOH solution (Kp 1.0075). The volume of the titrant in the control experiment is 10.3 ml.

Task 3.Calculate the volume of 0.5 n sodium hydroxide solution (Kp 0.9931), which will be used to titrate the excess of acetic acid in the quantitative determination of diethylstilbestrol by FH, if the exact weight is 0.4985 g. The content of diethylstilbestrol is 99.5%, vol. titrant volume in the control experiment — 15.1 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 schemeEstradiol dipropionate, Estradiol dipropionate, Sinestrol, Diethylstilbestrol, Progesterone, Pregninwith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationEstradiol dipropionate, Estradiol dipropionate, Sinestrol, Diethylstilbestrol, Progesterone, Pregnin.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationEstradiol dipropionate, Estradiol dipropionate, Sinestrol, Diethylstilbestrol, Progesterone, Pregnin.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: Vitamins are water soluble.

Goal:to acquaint students with the pharmaceutical analysis of drugs from the groupwater-soluble vitamins.

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

Plan

1. Theoretical questions:

1. Characteristics of drugs from the groupwater-soluble vitamins.
2. Classification of drugs from the groupwater-soluble vitamins.
3. Methods of analysis of drugs from the groupwater-soluble vitamins.

Questions for self-control:

1. the relationship between the structure and pharmacological effect of drugs from the groupwater-soluble vitamins.
2. mechanism of action of drugs from the groupwater-soluble vitamins.
3. methods of obtaining medicines from the groupwater-soluble vitamins.
4. methods of analysis of drugs from the groupwater-soluble vitamins.
5. use in medicine of medicines from the groupwater-soluble vitamins.

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.Describe the quantitative determination of nicotinic acid amide by acidimetry in non-aqueous solvents. Give the corresponding reaction equations, the calculation formulas for the calculation of the quantitative content and 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 schemeAscorbic acid, Calcium pangamate, Calcium pantothenate, Nicotinic acid, Nicotinamidewith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationAscorbic acid, Calcium pangamate, Calcium pantothenate, Nicotinic acid, Nicotinamide.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationAscorbic acid, Calcium pangamate, Calcium pantothenate, Nicotinic acid, Nicotinamide.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: Vitamins are water soluble.

Goal:to acquaint students with the pharmaceutical analysis of drugs from the groupwater-soluble vitamins.

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

Plan

1. Theoretical questions:

1. Characteristics of drugs from the groupwater-soluble vitamins.
2. Classification of drugs from the groupwater-soluble vitamins.
3. Methods of analysis of drugs from the groupwater-soluble vitamins.

Questions for self-control:

1. the relationship between the structure and pharmacological effect of drugs from the groupwater-soluble vitamins.
2. mechanism of action of drugs from the groupwater-soluble vitamins.
3. methods of obtaining medicines from the groupwater-soluble vitamins.
4. methods of analysis of drugs from the groupwater-soluble vitamins.
5. use in medicine of medicines from the groupwater-soluble vitamins.

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 chemical structure of thiamine and give the formulas of its pharmacopoeial agents and phosphorylated derivatives. Write the reaction equation of the thiochrome sample.

Task 2.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.

Task 3.Calculate the percentage content of retinyl acetate according to FC. The optical density of the investigated solution is 0.45, the exact weight is 0.0287 g.

3. Calculate the specific rotation of 1% of the soilRetinol acetate, angle of rotation +0.9°. The thickness of the cuvette is 1 dm.

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 schemePyridoxine hydrochloride, Thiamine hydrobromide and hydrochloride, Folic acid, Riboflavin, Rutinwith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationPyridoxine hydrochloride, Thiamine hydrobromide and hydrochloride, Folic acid, Riboflavin, Rutin.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationPyridoxine hydrochloride, Thiamine hydrobromide and hydrochloride, Folic acid, Riboflavin, Rutin.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: Medicinal products affecting immunity processes (immunotropic agents).

Goalto acquaint students with the pharmaceutical analysis of drugs affecting immunity processes (immunotropic agents).

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

Plan

1. Theoretical questions:

1. Characteristics of medicinal products affecting immune processes.
2. Classification of drugs that affect immunity processes.
3. Methods of analysis of medicinal products affecting immune processes.

Questions for self-control:

1. the relationship between the structure and the pharmacological effect of drugs affecting the processes of immunity.
2. the mechanism of action of drugs that affect immunity processes.
3. methods of obtaining medicinal products that affect immunity processes.
4. methods of analysis of medicinal products affecting immunity processes.
5. the use in medicine of medicinal products affecting immunity 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 methyluracil (M. m. 676.8), if the so-called titration 0.4876 g per FH used 7.1 ml of 0.1 M perchloric acid (Kp 0.9872). The volume of the titrant in the control experiment was 0.16 ml, the loss in mass during drying was 3.2%.

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 dibazole (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 volume of 0.1M sodium thiosulfate solution (KP=1.0000), which will be used for the titration of 0.2816 g of methionine (M.m. 149.21), if its percentage content in the substance is 98.7%, and the titrant volume in the control experiment was 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 schemeDibazol, Methyluracil with an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationDibazol, Methyluracil.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationDibazol, Methyluracil.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: Anorexigenic means. Means for the treatment of alcoholism.

Goalto acquaint students with the pharmaceutical analysis of drugs from the group of anorexic drugs, drugs for the treatment of alcoholism.

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

Plan

1. Theoretical questions:

1. Characteristics of drugs from the group of anorexic drugs.
2. Characteristics of drugs for the treatment of alcoholism.
3. Classification of drugs from the group of anorexic drugs.
4. Classification of drugs for the treatment of alcoholism.
5. Methods of analysis of drugs from the group of anorexic drugs.
6. Methods of analysis of drugs for the treatment of alcoholism.

Questions for self-control:

1. the relationship between the structure and pharmacological effect of drugs from the group of anorexic drugs, drugs for the treatment of alcoholism.
2. the mechanism of action of drugs from the group of anorexic drugs, drugs for the treatment of alcoholism.

3. methods of obtaining drugs from the group of anorexic drugs, drugs for the treatment of alcoholism.

4. methods of analysis of drugs from the group of anorexic drugs, drugs for the treatment of alcoholism.

5. use in medicine of drugs from the group of anorexic drugs, drugs for the treatment of alcoholism.

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 what volume of 0.1 M sodium edetate solution (KP=0.9998) will be spent on titrating 0.7422 g of calcium gluconate (M.m. 448.4), if its percentage content in the substance is 99.7 %.

Task 2.Calculate the weight of glutamate acid (M.m. 147.13), if 20.06 ml of 0.1M sodium hydroxide solution (KP=1.0000) was used for its titration by the method of direct alkalimetry, and its percentage content in the substance is 99, 1%

Task 3.Calculate the volume of 0.1M sodium thiosulfate solution (KP=1.0000), which will be used for the titration of 0.2816 g of methionine (M.m. 149.21), if its percentage content in the substance is 98.7%, and the titrant volume in the control experiment was 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 schemePhenamine, Fepranon, Desopimon,Sibutramine, Fenfluramine with an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationPhenamine, Fepranon, Desopimon,Sibutramine, Fenfluramine.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationPhenamine, Fepranon, Desopimon,Sibutramine, Fenfluramine.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.

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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.

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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: Anti-ulcer drugs.

Goal:to acquaint students with the pharmaceutical analysis of anti-ulcer drugs.

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

Plan

1. Theoretical questions:

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

Questions for self-control:

1. the relationship between the structure and pharmacological action of anti-ulcer drugs.
2. the mechanism of action of anti-ulcer drugs.
3. methods of obtaining anti-ulcer drugs.
4. methods of analysis of anti-ulcer drugs.
5. use of anti-ulcer 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 atropine sulfate (M. m. 676.8), if the so-called titration 0.4876 g per FH used 7.1 ml of 0.1 M perchloric acid (Kp 0.9872).

The volume of the titrant in the control experiment was 0.16 ml, the loss in mass during drying was 3.2%.

Task 2. Calculate the specific rotation of 5% atropine sulfate, if the angle of rotation is - 0.4°, the thickness of the cuvette is 2 dm.

Task 3.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%.

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 schemeOmeprazole, Atropine sulfate, Metronidazole, Amoxicillin with an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationOmeprazole, Atropine sulfate, Metronidazole, Amoxicillin.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationOmeprazole, Atropine sulfate, Metronidazole, Amoxicillin.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: Sorbents, antidotes and complexons.

Goal:to acquaint students with the pharmaceutical analysis of sorbents, antidotes and complexons.

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

Plan

1. Theoretical questions:

1. Characteristics of sorbents.

2. Characteristics of antidotes.

3. Characteristics of complexes.

4. Classification of sorbents, antidotes and complexons.

5. Methods of analysis of sorbents, antidotes and complexons.

Questions for self-control:

1. the relationship between the structure and pharmacological action of sorbents, antidotes and complexons.

2. the mechanism of action of sorbents, antidotes and complexons.

3. methods of obtaining sorbents, antidotes and complexes.

4. methods of analysis of sorbents, antidotes and complexons.

5. use of sorbents, antidotes and complexons 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 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.

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 schemeCopper sulfate, magnesium sulfate, sodium chloride, calcium gluconate, sodium nitrite, sodium thiosulfate, calcium chloride, magnesium oxidewith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationCopper sulfate, magnesium sulfate, sodium chloride, calcium gluconate, sodium nitrite, sodium thiosulfate, calcium chloride, magnesium oxide.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationCopper sulfate, magnesium sulfate, sodium chloride, calcium gluconate, sodium nitrite, sodium thiosulfate, calcium chloride, magnesium oxide.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.

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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.

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

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

Independent work No. 14

Topic: Radiopaque and other diagnostic tools.

Goal:to acquaint students with the pharmaceutical analysis of radiopaque and other diagnostic agents.

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

Plan

1. Theoretical questions:

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

Questions for self-control:

1. the relationship between the structure and pharmacological action of radiopaque agents.
2. mechanism of action of radiopaque agents.
3. methods of obtaining radiopaque agents.
4. methods of analysis of radiopaque agents.
5. use of radiopaque 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.Rules for working with radioactive medicinal products.

Task 2.Conditions of storage, supply and transportation of radioactive medicinal products.

Task 3.Features of radiometric analysis of radioactive drugs. How is the radiochemical composition and specific activity of drugs with radioactive isotopes determined?

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 schemebarium sulfate,Iodineradiopaque agents, radiopharmaceutical drugswith an indication of the chemical names of the starting compounds, intermediate and final products.

2. To propose possible methods of identificationbarium sulfate,Iodineradiopaque agents, radiopharmaceutical drugs.Where possible, give chemical equationsreactions

3.Describe methods of quantitative determinationbarium sulfate,Iodineradiopaque agents, radiopharmaceutical 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.

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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.

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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.

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