

**Independent work for 2nd year students of the specialty 33.05.01
"Pharmacy" in the discipline "Analytical chemistry" in the IV semester**

Topics for preparing a comprehensive independent work:

1. Redox titration.
2. Gravimetric analysis.
3. Acid-base titration.
4. Acid-base titration (neutralization method).
5. Acid-base titration curves.
6. Permanganatometric titration.
7. Dichromatometric titration.
8. Iodometry.
9. Chlorodiodometry and iodometry.
10. Argentometry.
11. Bromatometry, brometry, nitritometry.
12. Sedimentary titration.
13. Cerimetry.
14. Complexometric titration.
15. Indicator errors of complexometric titration.
16. Mercury measurement.
17. Pharmaceutical analysis.
18. Potentiometric analysis.
19. Titration (acid-base) in non-aqueous media.
20. Molecular spectral analysis in the UVI region of the spectrum
(application in quantitative analysis).
21. Analysis of compounds of organic nature.
22. Mercury measurement. Hexacyanoferrateometry. Sulfatometry.
23. Methods of absorption analysis.
24. Analysis of compounds of organic nature.
25. Photometric analysis.
26. Romanov spectroscopy.

27. Physical analysis methods.
28. Conductometric analysis (conductometry).
29. Polarographic Analysis (Polarography direct voltammetry).
30. Nuclear magnetic resonance spectroscopy.
31. The concept of the origin of electronic absorption spectra.
32. Luminescent analysis.

Guidelines for the implementation of integrated independent work.

Comprehensive independent work on the proposed topics is performed by the student in electronic form in the Microsoft Word program.

Comprehensive work should be a volume of 15-25 printed pages, performed by the student for a long period (three months).

It contains an accurate presentation of the essence of the topic on the basis of several books, monographs or other primary sources. The work should contain basic factual information and conclusions on the subject.

Integrated Functions:

- ✓ informative (fact-finding);
- ✓ search engine;
- ✓ reference;
- ✓ signal;
- ✓ indicative.

The degree to which these functions are performed depends on the substantive and formal qualities of the integrated work, as well as on who uses them for what purposes.

Requirements for the language of complex work: it should be distinguished by accuracy, brevity, clarity and simplicity.

The structure and order of presentation of the material

- Title page (see Appendix 1, separate sheet)
- Contents (see Appendix 2, separate sheet)
- Introduction (see Appendix 3, a separate sheet or several)

- Chapter 1. Literature review (the text of this and the next chapter begins on a new page. It contains a review and analysis of the literature on the problem being developed, the history of the issue, the level of development of the problem in theory and practice, analysis and comparison of various points of view, and suggesting your opinion and solution Problems)

- Chapter 2. The practical part (contains a description of the algorithm for solving problems on a selected topic (tasks are provided to the student in an individual form)).

- Conclusion (a separate sheet or several sheets. Conclusion - contains the results of the work, the most important conclusions that the student came to as a result of the work. The approximate amount of the conclusion is 1-2 pages)

- List of used literature (single sheet or several sheets. (At least 10 sources) - contains an alphabetical list of used literature. The list is made out strictly in accordance with the rules of the bibliography. See Appendix 4).

Clearance requirements

- ✓ Text format - Microsoft Word (* .doc, * .docx)
- ✓ Page format: A4 (210x297 mm);
- ✓ Orientation - portrait;
- ✓ Fields (upper, lower, left, right) of 20 mm;
- ✓ Font: size (size) - 14;
- ✓ Font Type: Times New Roman;
- ✓ Line spacing - one and a half.
- ✓ Red line - 1.25

- Page numbering (located at the bottom center, the title page is not numbered but included in the page count, - Font: size (size) - 12; Font type: Times New Roman (for numbering!)).

Graphic material (drawing, diagram, diagram, drawing)

According to GOST 7.32-2001, all graphic material (drawing, diagram, diagram, drawing, etc.) in the text must be referenced. Graphic material should be located immediately after the text in which they are mentioned for the first time, or

on the next page. Graphic material is numbered in Arabic numerals. The signature for it is located under it in the middle of the line. Any graphic material (drawing, diagram, diagram, drawing, etc.) is indicated by the word "Fig. Title". Pictures should be inserted into the text and be clear, black and white. Numbering of drawings through.

Example:

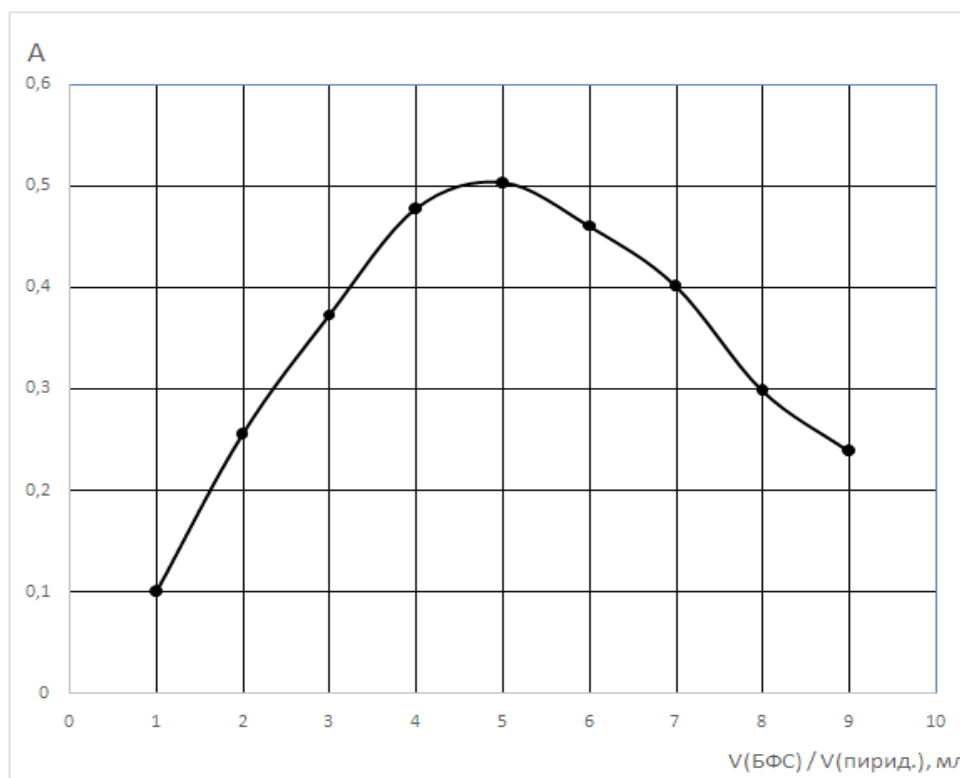


Fig. 1. Isomolar series for the system: BFS - pyridoxine. $C(Fe^{2+}) = 1 \cdot 10^{-4}$ mol / l, pH = 7, l = 0.5 cm, PE-5400

Tables

Tables are used for better visibility and ease of comparison of numerical values of indicators (parameters, sizes, etc.). It is advisable to apply the tabular form if various indicators can be grouped according to some common feature (for example, physico-chemical indicators), and each of the indicators can have two (or more) values. Tables are typed uniformly throughout the text. All tables in the text should be referenced. The table should be located immediately after the text in which it is mentioned for the first time, or on the next page. The table is beaten from the text above and below by an empty line.

Above the table place the word "Table". After it give the table number. In this case, a dot after the table number is not set. All tables are numbered. Numbering is end-to-end. To clarify and / or clarify the contents of the table, its name is given, which is written with a capital letter above the table on the next line in the center with highlighted bold type. In this case, the point after the name of the table is not set.

The text of the table is made out:

- Font: size (size) - 12;
- Font Type: Times New Roman;
- Line spacing - single.
- The red line is not.

Example:

Table 3

Reflection and transmission coefficients of a light wave with a thin metal film

Bibliography

Bibliographic references in complex works should be carried out in accordance with GOST R 7.0.5-2008 and GOST 7.82-2001. The used literature (without repetition) is drawn up at the end of the text in alphabetical order under the name "List of used literature". The text is indicated by square brackets with the number of the source on the list and separated by commas - page numbers, for example: [3, p. 111]. We use literature over the past 10 years !!!

**Federal State Budgetary Educational Institution of Higher Education
«Astrakhan State Medical University»
of the Ministry of Healthcare of the Russian Federation**

Department of Chemistry, Faculty of Pharmacy

INDEPENDENT WORK ON THE DISCIPLINE

"ANALYTICAL CHEMISTRY"

ON THE TOPIC: «_____»

SPECIALTY: 33.05.01 Pharmacy

Completed by the student:

(Full Name)

Group 209

Head:

V.V. Uranova
(initials, last name)

(signature)

**Assistant, Department of
Chemistry, Faculty of Pharmacy**

**Assessment and date of work
performed:**

(rating)

(decryption)

Astrakhan, 2020

Content

Introduction	Ошибка! Закладка не определена.
Chapter 1. Literature review	Ошибка! Закладка не определена.
1.1.Name	Ошибка! Закладка не определена.
1.2.....	Ошибка! Закладка не определена.
1.3.....	Ошибка! Закладка не определена.
1.4.....	Ошибка! Закладка не определена.
1.5.....	Ошибка! Закладка не определена.
1.6.....	Ошибка! Закладка не определена.
1.7.....	Ошибка! Закладка не определена.
Chapter 2. The practical part	Ошибка! Закладка не определена.
2.1. Name	Ошибка! Закладка не определена.
2.2.....	Ошибка! Закладка не определена.
2.3.....	Ошибка! Закладка не определена.
Conclusion.....	Ошибка! Закладка не определена.
Bibliography	Ошибка! Закладка не определена.

Introduction

Introduction - contains a clear and concise justification of the topic of work, its relevance, subject and object of study, the formulation of goals and objectives, principles laid down. The approximate volume of introduction is 1-2 pages.

Bibliography

1. Analytical chemistry: Textbook / Ed. Ischenko A.A. - M .: Academia, 2017 .-- 512 c.

2. Analytical chemistry. Separation methods and hybrid methods of analysis. T.2 / Ed. Moskvina L. .. - M .: Academia, 2018 .-- 608 p.