

General Chemistry
Home tasks
For Foreign students
(Dentistry)

LESSON 1

Theme: «The bases of biogenic elements chemistry»

- 1. Safety measures.**
- 2. Hydrolysis.**
- 3. Complexation reactions.**

Literature:

- 1. Essential chemistry for foreign students. p. 106 – 112.**

LESSON 2

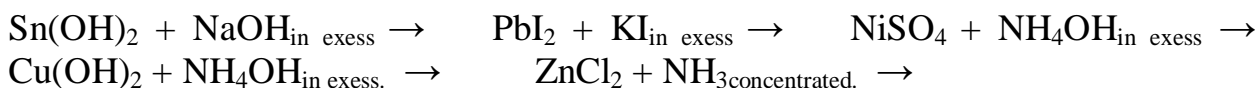
Theme: «Introduction to the titration methods of analysis»

The different concentration units.

- 1. Test** (equations of hydrolysis and complexation reactions).
- 2. Laboratory work:** Measuring volumes of solutions in the titration analysis.

In the book “Laboratory works and home tasks in general chemistry”:

- read and learn the topic p. 4 – 11.
- learn and memorize the different concentration units and formulas p. 4 – 5.
- solve problems 2, 3, 4, 6 p. 17 – 18. (standards of problem solutions 1, 2, 3, 4 p. 19 – 20.)
- answer the test questions p. 16 – 17.
- get acquainted with the laboratory work p. 13 - 16.
- write the possible hydrolysis reactions in molecular and ionic forms for the salts cobalt nitrate (II), potassium nitrite, ammonium carbonate, chromium sulfide (III);
- write the complexation reactions in molecular and ionic forms:



LESSON 3

Theme: «Introduction to the titration methods of analysis»

1. Test “The different concentration units”.

2. Laboratory work: The preparation of titrants by the dilution of a concentrated solution.

In the book “Laboratory works and home tasks in general chemistry”:

- read and learn the topic p. 11 – 12.
- answer the main questions of the topic p. 12 – 13.
- solve problems 5, 7, 8, 9 p. 18 – 19. (standards of problem solutions p. 19 - 20)
- get acquainted with the laboratory work p. 30 – 31.

LESSON 4

Theme: «Acid-Base titration»

1. Test on the theme of the lesson.

2. Laboratory work: Standardization of a titrant with the solution of a primary standard.

In the book “Laboratory works and home tasks in general chemistry”:

- read and learn the topic p. 21 – 28.
- answer the main questions of the topic p. 28.
- solve problems 1, 2, 3, 4, p. 35 – 36. (standards of problem solutions 1, 2, 3, 4, p. 37 – 38.)
- answer the test questions p. 34 – 35.
- get acquainted with the laboratory work p. 31 – 33.

LESSON 5

Theme: «Oxidation-Reduction titration. Oxidation-reduction processes. The method of half-reaction. Oxidimetry. Permanganatometry»

1. Test on the theme of the lesson.

2. Laboratory work: Determination of the mass of a substance in the given volume of the analyzed solution.

In the book “Laboratory works and home tasks in general chemistry”:

- read and learn the topic p. 39 – 51.
- using the electron-ion method (half-reaction method) write OR reactions 1, 2, 3, 4, 5, 6, 7, p. 54 – 55.
- do exercises II and III p. 57 – 58.
- solve problems 2, 3, 5, 6, p. 65 – 66. (standards of problem solutions p. 67 – 68.)
- get acquainted with the laboratory work p. 61 – 62.

LESSON 6

Theme: «Oxidation-Reduction titration. Iodometry»

1. Test on the theme of the lesson.

2. Laboratory work: Determination of a substance mass in the sample using iodometry.

In the book “Laboratory works and home tasks in general chemistry”:

- read and learn the topic p. 51 - 54.
- answer the main questions of the topic p. 54.
- using the electron-ion method (half-reaction method) write OR reactions 8, 12, 13, 18, 19 p. 55 – 57.
- answer the test questions p. 64.
- solve problems 7, 9, 11 p. 66 – 67. (standards of problem solutions p. 67 – 69.)
- get acquainted with the laboratory work p. 62 – 63.

LESSON 7

Theme: «Colligative properties of solutions»

1. Test: Oxidation – reduction reactions.

2. Solving problems.

Lecture’s material.

In the book “Essential chemistry for foreign students”:

- read and learn the topic p. 80 – 93.

In the book “Laboratory works and home tasks in general chemistry”:

- answer the main questions of the topic p. 80.
- answer the test questions p. 81 – 82.
- solve problems 1-4, 8, 9-11 p.82 – 84 (standards of problem solutions p. 84 – 87).

LESSON 8

Theme: «Colligative properties of solutions»

1. Test on the theme of the lesson.

2. Laboratory work: Hemolysis of erythrocytes in hypotonic solution.

Lecture’s material.

In the book “Essential chemistry for foreign students”:

- read and learn the topic p. 80 – 93.

In the book “Laboratory works and home tasks in general chemistry”:

- answer the main questions of the topic p. 80.
- answer the test questions p. 81 – 82.
- solve problems 5, 6, 7, p. 83 (standards of problem solutions p. 84 – 87).
- get acquainted with the laboratory work p. 80.

LESSON 9

Theme: «Acid-Base equilibrium. The pH level of water solutions»

1. Test on the theme of the lesson.

2. Laboratory work: Determination of active acidity of biological fluids.

Lecture’s material.

In the book “Essential chemistry for foreign students”:

- read and learn the topic p. 93 – 101.

In the book “Laboratory works and home tasks in general chemistry”:

- answer the main questions of the topic p.88.
- answer the test questions p.96 – 97.
- solve problems 1-4, p. 98 (standards of problem solutions p. 99 – 100).
- get acquainted with the laboratory work p. 95 - 96.

LESSON 10

Theme: «Acid-Base equilibrium. Buffer solutions».

1. Test on the theme of the lesson.

2. Laboratory work: Preparation of buffer solutions and investigation of mechanism of their action.

Lecture’s material.

In the book “Essential chemistry for foreign students”:

- read and learn the topic p. 101 - 106.

In the book “Laboratory works and home tasks in general chemistry”:

- answer the main questions of the topic p. 101.
- answer the test questions p.102 – 104.
- solve problems 1-4, p. 104 - 105 (standards of problem solutions p. 105 – 107).
- get acquainted with the laboratory work p. 101 - 102.

LESSON 11

Colloquium on the theme: “Solutions and their properties”.

1. Lecture's material.
2. In the book “Essential chemistry for foreign students” p. 80 – 106.
3. In the book “Laboratory works and home tasks in general chemistry” p. 4 – 70, 80 – 108.
4. Revise all the main questions on the topics.
5. Revise all the test questions.
6. Revise all standards of problem solutions.

LESSON 12

Theme: «Chemical Thermodynamics»

1. **Test** on the theme of the lesson.
2. **Laboratory work:** Determination of the heat effect of neutralization reaction.
Lecture's material.

In the book “Essential chemistry for foreign students”:

- read and learn the topic p. 34 - 59.

In the book “Laboratory works and home tasks in general chemistry”:

- answer the main questions of the topic p. 70.
- answer the test questions p. 72 – 74.
- solve problems 1-5, p. 74 - 75 (the table of standard H_f^0 , S_f^0 , G_f^0 p. 75).
- get acquainted with the laboratory work p. 70 – 72.

LESSON 13

Theme: «Chemical Kinetics»

1. **Test** on the theme of the lesson.
2. **Laboratory work:** The influence of sodium sulfite concentration on the rate of the sulfite oxidation reaction by potassium iodate in the acidic medium.

Lecture's material.

In the book “Essential chemistry for foreign students”:

- read and learn the topic p. 59 - 79.

In the book “Laboratory works and home tasks in general chemistry”:

- answer the main questions of the topic p. 76.

- answer the test questions p. 77 – 78.
- solve problems 1, 2, p. 78 (standards of problem solutions p. 79).
- get acquainted with the laboratory work p. 76 – 77.

LESSON 14

Theme: «Heterogeneous equilibrium»

1. Test on the theme of the lesson.

2. Laboratory work: Obtaining of heterogeneous systems “precipitate - solution” and the shift of equilibrium in heterogeneous system “precipitate - solution”.

Lecture’s material.

In the book “Essential chemistry for foreign students”:

- read and learn the topic p. 112 - 120.

In the book “Laboratory works and home tasks in general chemistry”:

- answer the main questions of the topic p. 108.
- answer the test questions p. 114 – 115.
- solve problems 1-5, p. 116 (standards of problem solutions p. 117 – 119).
- get acquainted with the laboratory work p. 108 – 110. Task 1, task 2 (only experiments 2 and 3).

LESSON 15

Theme: «Electrochemistry. Potentiometry»

1. Test on the theme of the lesson.

2. Laboratory work: Determination of a weak acid solution concentration and its dissociation constant by the potentiometric titration.

Lecture’s material.

In the book “Essential chemistry for foreign students”:

- read and learn the topic p. 121 - 138.

In the book “Laboratory works and home tasks in general chemistry”:

- answer the main questions of the topic p. 126.
- answer the test questions p. 128 – 129.
- solve problems 1-5, p. 129 – 130 (standards of problem solutions p. 130 – 132).
- get acquainted with the laboratory work p. 126 – 128.

LESSON 16

Theme: «Physical Chemistry of surface phenomena».

1. Test on the theme of the lesson.

2. Laboratory work: Determination of the dependence of the surface tension of solutions on the length of the hydrocarbon chain.

Lecture's material.

In the book: “Essential chemistry for foreign students”:

- read and learn the topic p. 138-147.

In the book: “Laboratory works and home tasks in general chemistry”:

- answer the main questions of the topic p. 133.

- answer the test questions p. 136 – 139.

- solve problems 1, 2, 3 p. 139 (standards of problem solutions p. 140 - 141).

- get acquainted with the laboratory work p. 133 – 134.

LESSON 17

Theme: «Physical chemistry of dispersed systems.

Colloid solutions and their properties».

1. Test on the theme of the lesson.

2. Laboratory work: The preparation of colloid solutions by the method of condensation and the investigation of their optical properties.

Lecture's material.

In the book “Essential chemistry for foreign students”:

- read and learn the topic p. 157 - 160.

In the book “Laboratory works and home tasks in general chemistry”:

- answer the main questions of the topic p. 142 (questions 1 - 8).

- answer the test questions p. 145 – 147 (questions 1 - 10).

- solve problems 1 - 4 p. 150 (standards of problem solutions p. 151 - 152).

- get acquainted with the laboratory work p. 142 – 144.

LESSON 18

Theme: « Physical chemistry of dispersed systems. The stability and coagulation of dispersed systems».

1. Test on the theme of the lesson.

2. Laboratory work: The investigation of the coagulating effect of electrolytes on the sol and the determination of the charge sign of sol particles. The confirmation of the protective effect of gelatin.

Lecture's material.

In the book "Essential chemistry for foreign students":

- read and learn the topic p. 160 - 164.

In the book "Laboratory works and home tasks in general chemistry":

- answer the main questions of the topic p. 142 (questions 9 - 13).

- answer the test questions p. 147 – 149 (questions 11 - 26).

- solve problems 5, 6 p. 150 - 151 (standards of problem solutions p. 151 - 152).

- get acquainted with the laboratory work p. 144 – 145.

LESSON 19

Theme: «Physical Chemistry of solutions of biopolymers».

1. Test on the theme of the lesson.

2. Laboratory work: Determination of the swelling degree of gelatin at different pH levels.

Lecture's material.

n the book "Laboratory works and home tasks in general chemistry":

- answer the main questions of the topic p. 153.

- answer the test questions p. 154 – 156.

- solve problems 4,5,7-11 p. 157-158 (standards of problem solutions p. 158 - 159).

- get acquainted with the laboratory work p. 153 – 154.

