

Course Description

Discipline/Course: Chemistry 1.6.

The Basic Educational Program specialty: 20.03.01 «technosphere safety»

21.03.01 «petroleum engineering»

The department of General chemistry and chemical technology

Instructor: Julia Ju. Miroshnichenko, PhD

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Learning Outcomes:

Result No. 1. The student will demonstrate a knowledge and understanding of the fundamental laws of chemistry and chemical reactions, knowledge of the properties and methods for producing substances.

Result No. 2. The student will perform stoichiometric calculations; to determine the possibility of thermodynamic chemical processes; to record the reactions of chemical transformations of substances and their preparation; to draw analogies to change the properties of chemical compounds.

Result No. 3. The student will identify the relationship between the structure, properties and reactivity of chemical compounds.

Result No. 4. The student will apply this knowledge to determine, formulate and solve problems related to professional activities.

Course Outline:

Section 1. Basic laws and concepts of chemistry

Section 2. Structure of Matter

Section 3. Mechanism of chemical reactions

Section 4. Solutions

Practice 1. The main classes of inorganic compounds. Stoichiometric calculations.

Practice 2. The structure of the atom and the Periodic law.

Practice 3. Chemical bond, structure of molecules.

Practice 4. Concentration of the solutions.

Lab 1. The main classes of inorganic compounds.

Lab 2. Determination of equivalent and atomic weight of the metal.

Lab 3. Oxidation-reduction reactions.

Lab 4. The thermal effect of dissolution.

Lab 5. The rate of chemical reactions.

Lab 6. The chemical equilibrium.

Lab 7. Preparation and determination of the concentration of the solution.

Lab 8. Ion-exchange reactions.

Lab 9. Hydrolysis of salts.

Lab 10. Qualitative reaction.

Lab 11. Hardness of water.

Lab 12. Substance purification.

Course Delivery: one semester, 18 weeks

Prerequisites: “Mathematics 1.1”, “Physics 1.1”

Co-requisites: “Metrology, standardization and certification 1.1”, “Mathematics 3.1” and “Physics 3.1”

Final Assessment: Exam

Course Developer: Julia Ju. Miroshnichenko, PhD