

S. F. Bagnenko

2021

N/224-8 strn 25.10.2021

**PFSPbSMU**

Atoms and molecules. A chemical element, a simple substance, a complex substance, a mixture of substances. The concept of allotropic modifications. Relative atomic mass, relative molecular weight. The law of Avogadro and its consequence. The Mendeleev-Clapeyron equation. Valence and oxidation state.

The structure of nuclei and electron shells of atoms of chemical elements, s-, p-, d-elements. Periodic law and the structure of the periodic system. Isotopes. Types of chemical bonds: covalent (polar and nonpolar), ionic, hydrogen, metal. The structure of complex compounds. The state of matter, amorphous and crystalline substances. Types of crystal lattices.

Water: molecular structure, physical and chemical properties. The solubility of substances, the dependence of the solubility of substances on their nature, temperature and pressure. Types of solutions (gaseous, liquid, solid). The expression of the composition of the solution (mass fraction, volume fraction, molar concentration). The concept of colloidal solutions. The significance of solutions in medicine and biology, in everyday life. Electrolytic dissociation. The degree of dissociation. Strong and weak electrolytes. Ionic reaction equations.

Classification of reactions: addition, decomposition, substitution, exchange. The rate of chemical reactions and its dependence on various factors. Chemical reaction rate constant. Catalysis. Thermal effects of chemical reactions. Reversibility of reactions. Chemical equilibrium and conditions for its displacement. Redox reactions.

Oxides, acids, hydroxides, salts (classification, nomenclature, methods of preparation and properties).  
Amphoterism. Hydrolysis of salts: types of hydrolysis.

General characteristics of metals: physical and chemical properties. General methods for producing metals. Reactivity series. General characteristics of the IA- and IIA-groups of the periodic system. Properties of sodium, potassium, calcium and magnesium and their compounds. Water hardness and ways to eliminate it.

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Properties of chromium oxides and hydroxides (+2), (+3), chromates and dichromates. Properties of potassium permanganate; reduction of permanganate ion in acidic, neutral and alkaline environments. Properties of iron, iron oxides and hydroxides (+2) and (+3). Properties of copper compounds (+1) and (+2).

Properties of zinc oxide and hydroxide.

Medical and biological significance of the compounds of these metals.

### **Non-metals**

General characteristics of IVA-, VA-, VIA-, VIIA-groups of the periodic system. Hydrogen, its chemical and physical properties.

Chlorine. Properties and methods for producing hydrogen chloride and chlorides, hypochlorites, chlorates.

Oxygen, its production, comparison of the physical and chemical properties of oxygen and ozone, redox reactions involving hydrogen peroxide.

Sulphur, its physical and chemical properties. Properties and methods for producing sulphur compounds: hydrogen sulphide and sulphides, oxides, sulphurous acid and sulphites, sulphuric acid and sulphates.

Nitrogen, its physical and chemical properties, production. Properties of ammonia and ammonium salts, nitrogen oxides (+1), (+2) and (+4), nitric acid and nitrates, nitrous acid and nitrites. Synthesis of ammonia and nitric acid.

Phosphorus, its physical and chemical properties. Properties of phosphorus compounds: hydrogen phosphorus and phosphides, phosphorus oxides (+3) and (+5), phosphoric acid and phosphates.

Carbon, its physical and chemical properties. Properties and methods for producing carbon oxides and carbonates. The properties of carbonic acid.

Properties of silicon, silicon oxide, silicic acid and silicates. Medical and biological significance of these non-metals.

### **Theory of organic chemistry**

The theory of the chemical structure of organic compounds named after A. M. Butlerov. Isomerism. Homologous series. The electronic nature of chemical bonds in the molecules of organic compounds. Ways to break bonds, the concept of free radicals. Electronic and spatial structure of molecules on the example of methane, ethylene and benzene. The concept of hybridisation of atomic orbitals. The concept of the mutual influence of atoms on the example of several compounds (toluene, phenol, chloroacetic acid, etc.) General concepts of the chemistry of high molecular weight compounds (monomer, polymer, elementary unit, degree of polymerisation). Polymerisation and polycondensation reactions. The principles of the nomenclature of organic compounds.

### **The main classes of organic compounds**

Hydrocarbons: alkanes, alkenes, alkynes, diene hydrocarbons, aromatic hydrocarbons (physical and chemical properties, production methods). The idea of the structure of cycloalkanes. Oxygen-containing compounds: monohydric and polyhydric alcohols, phenol, aldehydes, carboxylic acids, esters (physical and chemical properties, production methods, biomedical value). Nitrogen-containing compounds, aliphatic and aromatic amines, amino acids (physical and chemical properties, production methods, biomedical value). The structure of individual representatives of amino acids: glycine, alanine, cysteine, serine, glutamic acid, lysine, phenylalanine and tyrosine. The structure and chemical properties of heterocyclic compounds (pyridine, pyrrole, pyrimidine, purine). The structure of pyrimidine and purine bases: cytosine, uracil, thymine, adenine, guanine.

### **Essential natural organic compounds**

The structure and properties of fats. Carbohydrates: mono-, di-, polysaccharides. The structure and properties of glucose, ribose, 2-deoxyribose, sucrose, starch, cellulose. The structure of fructose, maltose and lactose. The structure and properties of proteins. The structure of nucleotides and polynucleotides. Differences in the structure of DNA and RNA, their biological role.

***Typical quantitative exercises***

1. Calculation of the mass or volume fraction of the component.
2. Calculation of the molar concentration.
3. Calculation of the relative densities of substances in a gaseous state.
4. Calculation of the volume of a gaseous substance of known mass or known quantity under normal conditions and conditions that differ from normal.
5. Establishment of the molecular formula of a substance by mass fractions of elements or by mass of combustion products.
6. Calculation of the mass (volume, quantity of substance) of one of the participants in the reaction according to the known mass (volume, quantity of substance) of the other participant in the reaction.
7. Tasks for the excess and lack of reagents.
8. Tasks taking into account the yield of the reaction product as a percentage of theoretical yield.

***Typical qualitative exercises***

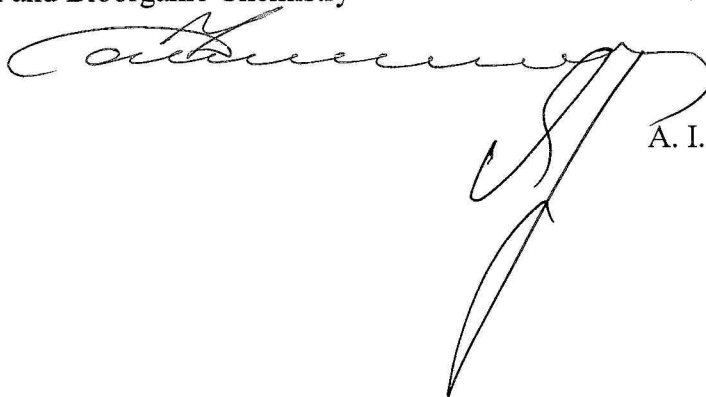
1. Writing reaction equations illustrating a scheme in which all or only individual steps are specified.
2. Multistage synthesis of organic or inorganic compounds.
3. Identification of the possibility of a reaction between substances in the proposed combination of substances.
4. Balancing redox equations using the electronic balance method.
5. Formulation of homologues and isomers of organic substances.

Head of the Department of General and Bioorganic Chemistry

K. N. Semenov

APPROVED:

Vice-rector for Academic Affairs



A. I. Yaremenko



**Federal State Budgetary Educational Institution of Higher Education  
«Pavlov First Saint Petersburg State Medical University»  
of the Ministry of Health of the Russian Federation  
(FSBEI of HI PFSPbSMU)**



Approved  
Rector of FSBEI of HI PFSPbSMU  
of the Ministry of Health of Russia

S. F. Bagnenko

*N224-12 om 25.10.2021* *S.F. Bagnenko* 2021

**Evaluation Criteria for Entrance Attendance-Based Testing in Chemistry (Oral Examination)  
for Applicants to the FSBEI of HI PFSPbSMU**

**CONTENTS AND STRUCTURE OF THE EXAMINATION TEST IN CHEMISTRY**

**CRITERIA FOR EVALUATION**

The content and structure of exam tests in chemistry are developed in accordance with the recommendations of the test materials of the Unified State Exam approved by the Ministry of Science and Higher Education ([www.fipi.ru](http://www.fipi.ru)).

The examination test consists of tasks based on the materials of several thematic blocks.

Task number	Task content	Grading criteria	The maximum score for completing the task	Task execution time (min)
<b>Part 1. Basic level</b>				
1	The structure of the nuclei and electron shells of atoms of chemical elements. Periodic law and structure of the Periodic system. Types of chemical bonds: covalent (polar and non-polar), ionic, hydrogen, metallic.	For a correct solution, 2 points are given, in the case of a wrong solution or its absence, 0 points are given; for a competent explanation of the answer, 3 points are given, in case of an incorrect explanation or its absence, 0 points are given.	5	5
2	The rate of chemical reactions and its dependence on various factors. Chemical reaction rate constant. Catalysis. Thermal effects of chemical reactions. Reversibility of reactions. Chemical equilibrium and conditions for its shift.	For a correct solution, 2 points are given, in the case of a wrong solution or its absence, 0 points are given; for a competent explanation of the answer, 3 points are given, in case of an	5	5



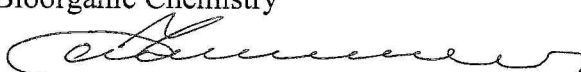
		incorrect explanation or its absence, 0 points are given.		
3	Regularities of the course of inorganic reactions (ionic, redox, hydrolysis and electrolysis).	For a correct solution, 5 points are given, in the case of a wrong solution or its absence, 0 points are given; for a competent explanation of the answer, 5 points are given, in case of an incorrect explanation or its absence, 0 points are given.	10	5
4	A .M. Butlerov's theory of the chemical structure of organic compounds. Isomerism. Homological series. Electronic and spatial structure of molecules. The concept of hybridisation of atomic orbitals. The concept of the mutual influence of atoms in molecules.	For a correct solution, 5 points are given, in the case of a wrong solution or its absence, 0 points are given; for a competent explanation of the answer, 5 points are given, in case of an incorrect explanation or its absence, 0 points are given.	10	5
5	Hydrocarbons: alkanes, cycloalkanes, alkenes, alkynes, dienes, aromatic hydrocarbons (physical and chemical properties, production methods).	For a correct solution, 5 points are given, in the case of a wrong solution or its absence, 0 points are given; for a competent explanation of the answer, 5 points are given, in case of an incorrect explanation or its absence, 0 points are given.	10	5
6	Oxygen- and nitrogen-containing compounds: monohydric and polyhydric alcohols, phenol, aldehydes, ketones, carboxylic acids, ethers and esters, amines, nitro compounds, amino acids	For a correct solution, 5 points are given, in the case of a wrong solution or its absence, 0 points are given; for a competent explanation of the	10	5

	(physical and chemical properties, production methods, biomedical value).	answer, 5 points are given, in case of an incorrect explanation or its absence, 0 points are given.		
<b>Part 2. Advanced level</b>				
7	Methods for producing various classes of inorganic compounds. (a reaction sequence).	For the correct solution, 5 points are given — 1 point for each transformation (5 transformations in total), in the case of an incorrect solution to the stage of the reaction sequence or the absence of a solution, 0 points are given for each reaction; for a competent explanation for each reaction, 1 point is given (5 points in total), in case of an incorrect explanation or its absence, 0 points are given for each reaction.	10	5
8	Methods for producing various classes of organic compounds. (a reaction sequence).	For the correct solution, 5 points are given — 1 point for each transformation (5 transformations in total), in the case of an incorrect solution to the stage of the reaction sequence or the absence of a solution, 0 points are given for each reaction; for a competent explanation for each reaction, 1 point is given (5 points in total), in case of an incorrect	10	5

		explanation or its absence, 0 points are given for each reaction.		
<b>Part 3. Proficiency level</b>				
9	Inorganic chemistry calculation task.	For the correct solution, 15 points are given (5 points for the correct writing of the equations of chemical reactions, formulae of substances and calculation formulae; 5 points for the correct course of the solution; 5 points for correct calculations with obtaining the correct answer), in the case of absence of any answer element, 0 points is given for each element.	15	10
10	Organic chemistry calculation task.	For the correct solution, 15 points are given (5 points for the correct writing of the equations of chemical reactions, formulae of substances and calculation formulae; 5 points for the correct course of the solution; 5 points for correct calculations with obtaining the correct answer), in the case of absence of any answer element, 0 points is given for each element.	15	10

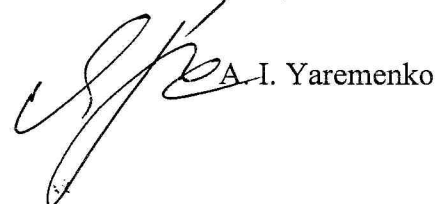
Head of the Department of General and Bioorganic Chemistry

K. N. Semenov



APPROVED:

Vice-rector for Academic Affairs



A. I. Yaremenko



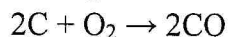
### SAMPLE EXAMINATION PAPER

1. The electronic structure is the same for  $\text{Ca}^{+2}$  and

- a)  $\text{K}^+$                       b) Ba                      c) Sr                      d)  $\text{F}^-$ .

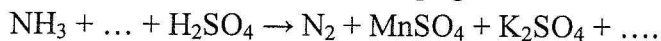
Write the electronic configuration of this ion.

2. How does the rate of a chemical reaction change



when the pressure doubles? Write the kinetic equation for the rate of a forward reaction.

3. Complete the redox reaction and equalise it using the electronic balance method, specify the oxidising agent and the reducing agent.



4. Give an example of an organic compound containing a carbon atom  $\text{C}^{+2}$ .

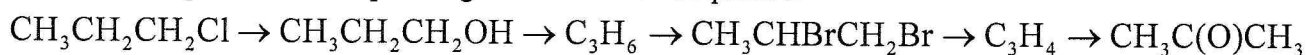
5. Give an example of a benzene halogenation reaction.

6. Write the equation of the qualitative reaction for phenol.

7. Write the equations corresponding to the reaction sequence.



8. Write the equations corresponding to the reaction sequence.



9. Sodium peroxide was treated with hot water. The resulting alkali solution was neutralized with 324 g of a 10% sulfuric acid solution. Determine the mass of peroxide taken.

10. A non-cyclic hydrocarbon weighing 8.4 g can add 3.36 litres of hydrogen. Determine the molecular formula of the compound and propose the structure of the isomers of the given composition.

**Federal State Budgetary Educational Institution of Higher Education  
«Pavlov First Saint Petersburg State Medical University»  
of the Ministry of Health of the Russian Federation  
(FSBEI of HI PFSPbSMU)**



Approved  
Rector of FSBEI of HI PFSPbSMU  
of the Ministry of Health of Russia  
S. F. Bagnenko

*С. Ф. Баженов* 2021 г.

*N224-10 om 25.10.2021*

**Evaluation Criteria for Entrance Distant Testing in Chemistry for Applicants to the FSBEI of  
HI PFSPbSMU**

**CONTENTS AND STRUCTURE OF THE EXAMINATION TEST IN CHEMISTRY**

**CRITERIA FOR EVALUATION**

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The examination test consists of tasks based on the materials of several thematic blocks.

Task number	Task content	Grading criteria	The maximum score for completing the task	Task execution time (min)
<b>Part 1. Basic level (computer testing)</b>				
1	The structure of nuclei and electron shells of atoms of chemical elements.	2 points are given for the correct answer; 0 points are given for an incorrect answer or its absence.	2	2–3
2	The periodic law and structure of the periodic system.	2 points are given for the correct answer; 0 points are given for an incorrect answer or its absence.	2	2–3
3	Types of chemical bonds: covalent (polar and nonpolar), ionic, hydrogen, metal.	2 points are given for the correct answer; 0 points are given for an incorrect answer or its absence.	2	2–3
4, 5	Classes of inorganic compounds: oxides, acids, hydroxides, salts (classification, nomenclature).	2 points are given for the correct answer; 0 points are given for an incorrect answer or its absence.	2	2–3

6, 7	The rate of chemical reactions and its dependence on various factors. Chemical reaction rate constant. Catalysis. Thermal effects of chemical reactions. Reversibility of reactions. Chemical equilibrium and conditions for its shift.	2 points are given for the correct answer; 0 points are given for an incorrect answer or its absence.	2	2–3
8	Hydrolysis of salts, types of hydrolysis.	2 points are given for the correct answer; 0 points are given for an incorrect answer or its absence.	2	2–3
9	Electrolysis of inorganic salts.	2 points are given for the correct answer; 0 points are given for an incorrect answer or its absence.	2	2–3
10	Redox reactions. The most common oxidising and reducing agents.	2 points are given for the correct answer; 0 points are given for an incorrect answer or its absence.	2	2–3
11–14	The structural theory of organic compounds by A. M. Butlerov. Isomerism. Homologous series.	2 points are given for the correct answer; 0 points are given for an incorrect answer or its absence.	2	2–3
15	Electronic and spatial structure of molecules. The concept of hybridisation of atomic orbitals. The concept of the mutual influence of atoms in molecules.	2 points are given for the correct answer; 0 points are given for an incorrect answer or its absence.	2	2–3
16	Hydrocarbons: alkanes, cycloalkanes, alkenes, alkynes, dienes, aromatic hydrocarbons (physical and chemical properties, production methods).	2 points are given for the correct answer; 0 points are given for an incorrect answer or its absence.	2	2–3
17	Oxygen-containing compounds: monohydric and polyhydric alcohols, phenols, aldehydes, ketones, carboxylic acids, ethers and esters (physical and chemical properties,	2 points are given for the correct answer; 0 points are given for an incorrect answer or its absence.	2	2–3



	production methods, biomedical significance).			
18	Qualitative reactions to various classes of organic compounds.	2 points are given for the correct answer; 0 points are given for an incorrect answer or its absence.	2	2–3
19, 20	Acid–base properties of organic compounds.	2 points are given for the correct answer; 0 points are given for an incorrect answer or its absence.	2	2–3
<b>Part 2. Advanced level (computer testing)</b>				
21	Methods for producing various classes of inorganic compounds.	For each correctly established correspondence or correctly selected statement, 3 points are given.	9	4–5
22	Methods for producing various classes of organic compounds.	For each correctly established correspondence or correctly selected statement, 3 points are given.	9	4–5
23	A calculation task in inorganic chemistry.	6 points are given for a correct answer; 0 points are given for an incorrect answer or its absence.	6	15
24	A calculation task in organic chemistry.	6 points are given for a correct answer; 0 points are given for an incorrect answer or its absence.	6	15
<b>Part 3. Theoretical questions (situational tasks)</b>				
25	A question in inorganic chemistry.	For each correct answer, 2 points are given (up to 6 points); for each correct explanation of the chosen answer, 3 points are given (up to 9 points); if the applicant is not able to give the correct answer or explain his choice, 0 points are given.	15	5 minutes to answer
26	A question in organic chemistry.	For each correct answer, 2 points are given (up to 6 points); for each correct explanation of the chosen	15	5 minutes to answer

		answer, 3 points are given (up to 9 points); if the applicant is not able to give the correct answer or explain his choice, 0 points are given.		
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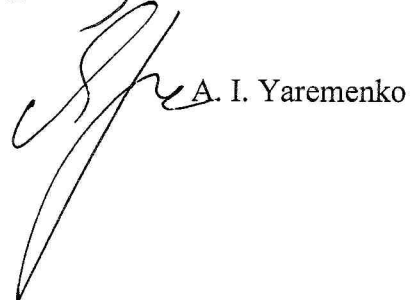
Head of the Department of General and Bioorganic Chemistry

K. N. Semenov



APPROVED:

Vice-rector for Academic Affairs



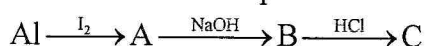
## SAMPLE EXAMINATION PAPER

### Test part

- Atom of which element in the ground state has one unpaired valence electron at the outer level  
a) Ca                                      b) Be                                      c) Mg                                      d) Li?
- Which element exhibits the greatest non-metallic properties  
a) N                                      b) P                                      c) As                                      d) Sb?
- A covalent non-polar bond is present in a following compound  
a) MgO                                      b) Br<sub>2</sub>                                      c) NH<sub>3</sub>                                      d) H<sub>2</sub>O.
- Select a pair of basic oxides  
a) Li<sub>2</sub>O and MgO      b) SO<sub>2</sub> and Na<sub>2</sub>O                                      c) Al<sub>2</sub>O<sub>3</sub> and CO<sub>2</sub>                                      d) BeO and Cl<sub>2</sub>O.
- Select a pair of hydroxides that exhibit only basic properties  
a) Al(OH)<sub>3</sub> and Ba(OH)<sub>2</sub>  
b) Ba(OH)<sub>2</sub> and KOH  
c) Sn(OH)<sub>2</sub> and Sr(OH)<sub>2</sub>  
d) NaOH and Zn(OH)<sub>2</sub>.
- How can the rate of the direct reaction  $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \rightleftharpoons 2\text{HI}(\text{g})$  be increased?  
a) by pressure decrease  
b) by temperature increase  
c) by HI concentration increase  
d) by temperature decrease
- How does the equilibrium shift in the system  $\text{C}_2\text{H}_2(\text{g}) + 2\text{H}_2(\text{g}) \rightleftharpoons \text{C}_2\text{H}_6(\text{g})$  with increasing pressure  
a) left                                      b) right                                      c) does not shift?
- Which salt can be detected in a solution using an indicator  
a) SrCl<sub>2</sub>                                      b) Na<sub>2</sub>SO<sub>4</sub>                                      c) Cu(NO<sub>3</sub>)<sub>2</sub>                                      d) KCl?
- During electrolysis of a solution of which salt, only hydrogen is released at the cathode  
a) RbCl                                      b) CuCl<sub>2</sub>                                      c) FeCl<sub>2</sub>                                      d) ZnCl<sub>2</sub>?
- What coefficient should be for acid in the reaction equation  
 $\text{MnO}_2 + \text{HCl} \rightarrow \text{MnCl}_2 + \text{Cl}_2 + \text{H}_2\text{O}$ ?  
a) 4                                      b) 2                                      c) 8                                      d) 16
- Select a pair of homologues  
a) butane and but-1-ene  
b) butan-1-ol and butan-2-ol  
c) nonane and decane  
d) but-2-ene and but-1-yne
- Select a pair of isomers  
a) hexane and heptane  
b) pentene and pentane  
c) hept-1-ene and hept-2-ene  
d) ethane and ethene
- In which compound are all carbon atoms in the sp<sup>3</sup>-hybridisation state  
a) but-1-ene                                      b) but-1-yne                                      c) hexane                                      d) hex-1-ene?
- Select the formula of the homologous series of dihydric saturated alcohols  
a) C<sub>n</sub>H<sub>2n</sub>O                                      b) C<sub>n</sub>H<sub>2n+2</sub>O                                      c) C<sub>n</sub>H<sub>2n</sub>O<sub>2</sub>                                      d) C<sub>n</sub>H<sub>2n</sub>(OH)<sub>2</sub>.
- Select a substance with a π-bond in its molecule  
a) ethene                                      b) butan-1-ol                                      c) isobutane                                      d) butane.

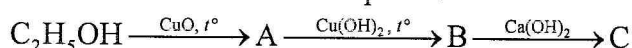


16. The reduction of butanal with hydrogen leads to the formation  
 a) butan-2-ol                      b) butan-1-ol                      c) but-1-ene                      d) but-2-ene.
17. Select a substance that does not react with acetic acid  
 a)  $\text{Na}_2\text{SO}_4$                       b)  $\text{CuO}$                       c)  $\text{Cu}(\text{OH})_2$                       d)  $\text{Na}_2\text{CO}_3$ .
18. Determine the sign of the reaction between phenol and bromine water  
 a) solution discolouration and the formation of a white precipitate  
 b) solution discolouration and the formation of a brown precipitate  
 c) solution discolouration without precipitation  
 d) formation of a solution with an intense blue colour.
19. Select a compound possessing acidic properties  
 a) methane                      b) cyclopropane                      c) propadiene                      d) propan-1-ol.
20. Select an organic compound possessing basic properties  
 a) butylamine                      b) nitroethane                      c) ammonia                      d) ethanol.
21. Indicate intermediate substances in the reaction sequence



- |   |                            |                             |                             |
|---|----------------------------|-----------------------------|-----------------------------|
| A | 1) $\text{HI}$             | 2) $\text{HIO}$             | 3) $\text{AlI}_3$           |
| B | 1) $\text{Al}_2\text{O}_3$ | 2) $\text{Al}$              | 3) $\text{Al}(\text{OH})_3$ |
| C | 1) $\text{Al}_2\text{O}_3$ | 2) $\text{Al}(\text{OH})_3$ | 3) $\text{AlCl}_3$          |

22. Indicate intermediate substances in the reaction sequence



- |   |  |  |   |
|---|--|--|---|
| A | 1) $\text{CH}_3\text{CHO}$                       | 2) $\text{CH}_3\text{COOH}$                    | 3) $(\text{CH}_3\text{COO})_2\text{Cu}$ |
| B | 1) $\text{C}_2\text{H}_5\text{COOH}$             | 2) $\text{CH}_3\text{COOH}$                    | 3) $(\text{CH}_3\text{COO})_2\text{Cu}$ |
| C | 1) $(\text{C}_2\text{H}_5\text{COO})_2\text{Ca}$ | 2) $(\text{C}_2\text{H}_5\text{O})_2\text{Ca}$ | 3) $(\text{CH}_3\text{COO})_2\text{Ca}$ |

23. When calcium carbonate was heated, part of the substance decomposed and 3.36 litres of gas were released. The mass of the solid residue was 18.4 g. This residue was added to 200 g of hydrochloric acid taken in excess. Determine the mass fraction of salt in the solution.

- |         |         |         |
|---------|---------|---------|
| a) 13 % | b) 26 % | c) 49 % |
| d) 57 % | e) 62 % | f) 73 % |

24. On combustion of 2 g of saturated monohydric alcohol, 4.4 g of carbon dioxide and 2.4 g of water were formed. The vapour density of the substance in relation to hydrogen is 30. Determine the molecular formula of the substance.

- |                                       |                                       |                                    |
|---------------------------------------|---------------------------------------|------------------------------------|
| a) $\text{C}_6\text{H}_{13}\text{OH}$ | b) $\text{C}_5\text{H}_{11}\text{OH}$ | c) $\text{CH}_3\text{OH}$          |
| d) $\text{C}_2\text{H}_5\text{OH}$    | e) $\text{C}_3\text{H}_7\text{OH}$    | f) $\text{C}_4\text{H}_9\text{OH}$ |

### Oral part

25. Establish a correspondence between reactants and products. Explain the answer based on the properties of inorganic compounds.

- |   |   |   |
|---|---|---|
| A) $\text{MgO} + \text{SO}_2 \rightarrow$           | 1) $\text{MgSO}_3$                      | 4) $\text{MgSO}_4$                      |
| B) $\text{MgO} + \text{SO}_3 \rightarrow$           | 2) $\text{MgSO}_3 + \text{H}_2$         | 5) $\text{MgSO}_4 + \text{H}_2$         |
| C) $\text{MgO} + \text{H}_2\text{SO}_3 \rightarrow$ | 3) $\text{MgSO}_3 + \text{H}_2\text{O}$ | 6) $\text{MgSO}_4 + \text{H}_2\text{O}$ |

26. Establish a correspondence between the reactants and the carbon-containing product that is formed during their interaction. Explain the answer based on the properties of organic compounds.

- |                                     |                    |                    |
|-------------------------------------|--------------------|--------------------|
| A) methanoic acid and calcium oxide | 1) calcium acetate | 4) methyl chloride |
| B) methanol and formic acid         | 2) calcium formate | 5) formaldehyde    |
| C) methanol and hydrogen chloride   | 3) methyl formate  |                    |