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METHODOLOGICAL RECOMMENDATIONS FOR TEACHING THE BASICS IN ADVANCED CLASSES

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ABSTRACT

This article describes effective methodical methods for teaching the topic of fundamentals in in-depth classes. Ways to use interactive teaching, laboratory work and technologies are shown in the teaching of the subject. The article recommends interactive approaches in explaining the chemical properties, reactions and importance of bases in everyday life. These methods help students to master the subject more deeply and to put their chemical knowledge into practice.

INTRODUCTION

The topic of bases is one of the important sections of chemistry, and it is of fundamental importance in understanding acid-base balance. Studying this topic in advanced classes requires not only the acquisition of theoretical knowledge, but also the development of practical experience and analytical thinking skills. This article presents recommendations on effective methodological methods, interactive approaches, and laboratory work used in the process of teaching the subject of fundamentals.

1. Lesson planning and main goals

The following main goals should be defined when teaching the basics:

- Explain the general properties of bases and interpret them based on their reactions with acids.
- Classification of bases, teaching their chemical and physical properties.
- Providing knowledge about the importance and application of basics in everyday life.

Bu maqsadlarni amalga oshirish uchun mavzuni rejalashtirishda o‘quvchilarning o‘zlashtirish darajasi va qiziqishlari inobatga olinishi kerak. Chuqurlashtirilgan sinflarda esa yanada kengroq yondashuv va murakkab tajribalarga e'tibor qaratiladi.

2. Interactive teaching methods

In order to increase the activity of students in the subject of basics, interactive teaching methods should be widely used. The following methods may be effective:

- "Brainstorming" method: Students are invited to give examples of the use of bases and acids in everyday life. For example, bases in household cleaning products or acids in food products.
- Group work: Divide students into small groups and give them tasks on the classification of different bases. Groups share experiences by defending their work.
- Experiment and analysis: Students study the physical and chemical properties of bases in laboratory conditions through experiments. For example, conducting experiments with water-soluble and insoluble bases.

3. Laboratory works and experiments

In advanced classes, laboratory work plays an important role in order to master the fundamentals in depth. Students are invited to perform the following experiments:

- Solubility and hydrolysis of bases in water: Monitoring the solubility of bases in water such as potassium hydroxide (KOH) and calcium hydroxide ($Ca(OH)_2$) and determining the environment in which they are formed.
- The reaction of bases with acids: Students observe by conducting an experiment how bases react with acids to form salt and water. For example, carrying out the reaction $NaOH + HCl \rightarrow NaCl + H_2O$.

4. Practical application and connection with everyday life

To make the topic of basics more interesting, you can relate it to how it is used in everyday life. For example, topics such as bases in cleaning products, lime used in agriculture or soda in the food industry attract students' attention and make science interesting.

5. Tests and independent assignments

To strengthen students' knowledge, it is necessary to prepare assignments and tests for independent work. For example:

- Writing chemical equations of different bases.
- Explain the reactions of bases and acids.
- Giving examples of the application of principles in everyday life.

6. Application of technologies

Using information and communication technologies, the explanation of the topic can be made interactive and visual. For example:

- Virtual labs: Help students perform experiments safely and quickly.
- Multimedia tools: The subject can be explained more vividly through animations and videos that teach the basics and their reactions.

SUMMARY

Teaching the basics in advanced classes can be done effectively by using modern methodological methods. Interactive teaching methods, laboratory activities and the use of technology increase students' interest in chemistry and help them to understand the subject more deeply. These approaches form not only theoretical knowledge, but also practical experience and analytical skills.

I present the following test tasks to strengthen the topic of basics. These tests help to assess students' knowledge of the subject and deepen their understanding of the chemical properties of bases.

Option 1

1. Which substance belongs to the group of bases?
   a) HCl
   b) NaOH

c) CO_2
d) SO_2

2. Which reaction does the following equation represent?
$NaOH + HCl \rightarrow NaCl + H_2O$
a) Neutralization
b) Oxidation
c) Divorce
d) Return

3. What kind of environment does a solution of bases in water create?
a) Neutral
b) Acid
c) Basic
d) Salty

4. Which base does not dissolve in water?
a) KOH
b) $Ca(OH)_2$
c) NaOH
d) $Fe(OH)_3$

5. Which reaction do amphoteric bases undergo?
a) Only with acid
b) Only with the base
c) With acid and base
d) With water

Option 2

1. Which base is amphoteric?
a) NaOH
b) $Al(OH)_3$
c) KOH
d) $Ca(OH)_2$

2. What is formed as a result of the reaction of bases with acids?
a) Salt and oxygen
b) Salt and water
c) Water and carbonate
d) Base and water

3. Which of the following substances is the main oxide?
a) CO_2
b) Na_2O

c) SO_3
d) P_2O_5

4. What compound is formed as a result of the reaction of basic oxides with water?
a) Salt
b) Acid
c) Basis
d) Peroxide

5. Which reaction shows the formation of a base?
a) $Na_2O + H_2O \rightarrow 2NaOH$
b) $CO_2 + H_2O \rightarrow H_2CO_3$
c) $SO_3 + H_2O \rightarrow H_2SO_4$
d) $CaO + CO_2 \rightarrow CaCO_3$

Option 3
1. What medium does a solution of calcium hydroxide in water form?
a) Acid
b) Neutral
c) Basic
d) Salty

2. What is the definition of amphoteric bases?
a) It reacts only in the basic medium
b) It also reacts with acid and base
c) It reacts only in an acidic environment
d) Enters oxidation-reduction reactions

3. What is the name of the interaction between bases and acids?
a) Neutralization
b) Electrolysis
c) Oxidation
d) Polymerization

4. Determine the substance formed during the hydrolysis of $Fe(OH)_3$ base:
a) HCl
b) H_2O
c) $FeCl_3$
d) Fe_2O_3

5. Which of the following substances has the main property?
a) H_2SO_4
b) NaOH

c) CO_2
d) NH_3

Option 4

1. Which substance reacts with acid and shows the main property?
a) KOH
b) SO_2
c) HCl
d) CO_2

2. What substances does NaOH react with?
a) Only with water
b) Only with acid
c) With acid and amphoteric bases
d) Only with the base

3. Which equation is correct for amphoteric bases?
a) $Al(OH)_3 + HCl \rightarrow AlCl_3 + H_2O$
b) $NaOH + H_2O \rightarrow Na_2O + H_2O$
c) $Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$
d) $SO_3 + H_2O \rightarrow H_2SO_4$

4. Which of the following compounds is formed when bases are dissolved in water?
a) HCl
b) NaOH
c) CO_2
d) NH_3

5. What chemical properties do bases have?
a) It does not dissolve in water and decomposes in an acidic environment
b) It dissolves in water and reacts with acids to form salt and water
c) It dissolves in water and releases oxygen
d) Enters only neutralization reactions

Through these tests, it is possible to strengthen knowledge of the basics and test the level of mastery of students.

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