POSSIBILITIES OF WIDE USE OF PRACTICAL METHODS OF TEACHING CHEMISTRY FOR ORGANIZING QUALITY EDUCATION

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Abstract
This article is devoted to the wider use of opportunities for chemical experiments in the educational system, approaches to modified, reworked experiments based on a new didactic purpose. In chemistry education, the organization of experiments suitable for topics taught only by theoretical methods increases students' interest in science and helps to form creative, critical, and creative thinking skills.

Keywords: chemical experiment, creative thinking, periodic law, diagonal similarity.

Wide use of practical methods is of particular importance in increasing the effectiveness of education, in the transition from informational education to education based on logical, creative, creative thinking. In this regard, natural sciences, including chemistry, have a special place. The most important task for the education system is to provide students with modern education, perfect education and an environment that develops mentally and spiritually.

The experiment takes a leading place in the teaching of chemistry and is a unique educational method that directly introduces chemical phenomena and, at the same time, develops the independent educational activity of students. Enriching the content of experiments, increasing the activity of students in their organization, and organizing experiments on subjects limited by theoretical methods in teaching serve as a means of increasing the interests and creativity of students. For this purpose, methodological guidelines for laboratory experiments on the subject of the periodic law were developed.

Experiments on the topic "Periodic law and periodic system of chemical elements".

Purpose of work: The essence of the periodic law and the structure of the periodic system and the possibilities of its use, creating knowledge and skills

Experiment 1. Comparison of chemical properties of elements located in the same period

Necessary equipment: Periodic table, test tubes, spatula, knife.

Required reagents:HCl solution, Na, Mg, Al, Cu.

The order of work: Put the same amount of hydrochloric acid solution into 4 test tubes, put small pieces of Na in the first, Mg in the second, Al in the third, and Cu in the fourth. Note the reaction rates. Consider the following when drawing conclusions. What is the relationship between the position of given elements in the periodic table and their reaction with acids (metallic properties)? How does the property of non-metals change in periods (non-metals are not affected by hydrochloric acid solutions)? How do the atomic structure of elements, the location of electrons and the atomic radius change in a given series of elements (periods)? Explain why there was no change in the Cu container (in terms of atomic structure and position in the periodic table).

Experiment 2. Comparison of chemical properties of elements in the same group

Necessary equipment: Periodic table, test tubes, spatula, knife, pipette.

Required reagents:HCl solution, Na, K, Cu.

The order of work: In three test tubes filled with water, put equal-sized pieces of potassium in the first, sodium in the second, and copper in the third. Observe the processes taking place in the test tubes. Observe this exact process by placing metals in hydrochloric acid. Consider the following when drawing conclusions. How do the metals in one group, one group (the main group) change Na and K with increasing mass of metallic properties (from top to bottom in the groups)? What is the relationship between their chemical properties, their place in the periodic system, atomic structure, and atomic radii? How to explain the difference in the chemical properties of copper, despite its placement in the same group. What is the reason for the difference between the properties of the main group and the additional (sub) group elements?

Experiment 3. Comparison of properties of diagonally located elements

Necessary equipment: Periodic table, Petri dish, test tubes, spatula, knife, pipette.

Required reagents: Water, Na, Ca, Mg.

The order of work: Try cutting a piece of sodium in a Petri dish. Also compare the cut piece of calcium. Take some of the magnesium powders and compare the appearance, softness and storage of all three metals. Place pieces of Na in the first of the three test tubes filled with water, Ca in the second, and Mg in the third. Observe and compare processes. Write your conclusions based on the answers to the following questions.

1) What are the similarities and differences in the physical and chemical properties of the three metals obtained?

2) How are these three metals stored in the laboratory and why?

3) Under normal conditions, Na and Ca react with water to release hydrogen, while Mg does not, explain this situation depending on their place in the periodic system.

4) Magnesium is located next to sodium in the periodic table, in the cell above calcium, that is, it is in the same period as sodium and in the same group as calcium. But what is the reason

why the properties of Na and Ca are more similar to each other than both of them in terms of physical and chemical properties?

5) Explain the reason for the diagonal similarity in relation to the position of the elements in the periodic table and their atomic radii.

Making systematic conclusions through questions and tasks in this direction teaches inductive logical thinking from private experiences to general laws, and deductive logical thinking in proving laws with experience.

The role of chemical experiment in the modern educational system increases when the experiment is used not only as an illustration, but also as a means of obtaining knowledge and drawing scientific conclusions. Experiments with the nature of research, using various methods and calculations in the experiment, to find unknown quantities, to perform experimental problems develop in students the characteristics of independent logical thinking, action, decision-making, and create skills for scientific research.

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