



PREPARING FUTURE CHEMISTRY TEACHERS TO INTRODUCE REPRODUCTION

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| Article history: | Abstract: |
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| Received: 26 th July 2021 Accepted: 28 th August 2021 Published: 30 th September 2021 | Our article develops the scientific and methodological basis of education to acquaint future chemistry teachers with the production of students. Students are prepared conditionally technological. |
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Strengthening and further improving the quality of educational work in chemistry classes is the most important task of the teacher who conducts education. A chemistry teacher is required to provide students with a clear, understandable, systematic, thorough, scientific knowledge of chemistry. It should not be forgotten that the task is to educate and prepare students for life on the basis of imparting thorough and systematic knowledge to students.

Introducing students to the chemical industry and imparting practical skills to students is defined in the standard curriculum of the high school chemistry course and the state standard. [1-2]. Chemical technology training course [3-4] is included in the standard curricula of universities and teacher training institutions, which is aimed at solving this problem.

The main form of organization of educational work in school is a lesson. The teacher not only acquaints students with chemical facts and laws and theoretical conclusions, but also acquaints students with the practical application of chemistry, some chemical companies, the problems of chemicalization of the country. The teacher conducts practical classes in the classroom, provides students with practical skills, teaches them to acquire knowledge independently and to use this knowledge to solve practical problems. In addition to the lessons, excursions and extracurricular activities are also held. [5].

In addition to a systematic and consistent presentation of chemical knowledge and knowledge of chemical production, the course also requires demonstration of experiments, production process diagrams, hardware models, films, slide shows, workshops, and production problems.

The teacher should describe the knowledge of chemical production after introducing students to the composition, physical and chemical properties and uses of substances. For example, before starting to organize the production of hydrochloric acid, students should be acquainted with the composition, physical and chemical properties of hydrochloric acid, its use in industry. After the teacher explains the importance of hydrochloric acid in the national economy, he describes the physical and chemical processes that form the basis of the production of hydrochloric acid by synthetic methods in industry. Then there is information about raw materials, the division of the production process into stages, the structure and principles of operation of the most important devices, the relationship of hydrochloric acid production with other industries. Therefore, in addition to describing the technical details, the instructor should focus on the chemical nature of the processes.

Before describing how certain substances are produced in a lesson, students should first be shown experiments that embody the scientific basis of chemical production. Students will be able to experiment with the formation of hydrochloric acid by synthetic methods, sulfuric acid by contact method, nitric acid by oxidation of ammonia, ammonium nitrate by direct addition of ammonia to nitric acid, superphosphate by phosphorites in sulfuric acid, alkalis and chlorine by electrolysis. need Drilling and cracking of oil, coking of coal, thermal decomposition of wood, etc. should also be mentioned. These experiments help students to understand the chemical nature of the technological process, the division of the technological process into stages, how the apparatus is structured, because the production process is primarily based on a chemical reaction.

In describing data on chemical production, in addition to demonstrating experiments, students should be shown diagrams of technological processes, models of typical apparatus, and models of individual devices. Few students can make these models in an organic circle. Presentation slides and videos should be included to introduce students to chemical production.

Since the development of teaching materials to provide information about chemical production in the classroom, the development of methods and technologies to explain it to students in a didactic way is one of the most important issues of the methodology. The purpose of the lessons is to help students and teachers to develop a clear idea and understanding of chemical production.

The above-mentioned ideas about conducting lessons, practical classes and extracurricular activities show that the adequate equipment of the chemistry room is of great importance for the formation of technological concepts. The chemistry classrooms of schools need to be better equipped in all respects. Improving the provision of school chemistry classrooms with general equipment (desks, demonstration tables, cabinets, etc.), taking reagents, utensils, items from the list approved by the Cabinet of Ministers of the Republic of Uzbekistan, filling the gaps in the room, Great care must be taken to ensure that the tools and instruction manuals that help them do so are also available to them. [5]

Teachers play a crucial role in inculcating polytechnic knowledge in students at school. The correctness of the study of the basics of science, the application of the field of production of the basics of science, the organization of extracurricular activities, the well-equipped school, etc., in many respects depends on the teaching staff. However, many chemistry teachers are not sufficiently prepared for the tasks of polytechnic education, they do not know the basics of chemical technology, they do not know the methodology of practical training, information about chemical enterprises, practical training and excursions.

Formation of polytechnic training of future chemistry teachers through lectures on chemical technology, laboratory and practical classes, special seminars, excursions to industrial enterprises after graduation, participation in courses organized by teacher training institutes, laboratory and technical workshops and independent learning. possible.

The work of improving knowledge in the field of chemical production in a small (independent) way should be based on reading the literature on chemistry and chemical technology, conducting independent experiments in the laboratory, making instruments, models, diagrams, tables and so on.

The better the best practices of teachers are organized and disseminated, the greater the success of polytechnic education tasks in schools.

The most difficult issue for teachers at the moment is the presentation of knowledge about chemical production in the classroom. Therefore, we will describe how to conduct classes dedicated to some of the industries mentioned in the program. The details of the lessons do not include well-known didactic requirements (scientific, historical, conformity, etc.), but each teacher must meet these requirements during a short lesson. It is important to make it a rule to start the lesson by asking and answering questions about how teachers have underestimated the material thrown in previous lessons. Questions and issues can be selected from the questions and issues listed at the end of each lesson description in order to find out how students have reduced the material thrown in previous lessons. Before describing the new material in the lesson, it is important to briefly outline what needs to be organized in this lesson. The material should be divided into some independent parts, and after each part is explained, students should be asked questions about this part so that they can better remember what they are learning. In order to summarize the new knowledge given in the lesson by asking students 3-4 questions and to place it well in their memories, it is necessary to leave time at the end of the lesson. This is especially important because students may not be able to find in the textbook the material needed to reinforce the knowledge presented in the lessons. Therefore, students should be asked to write in the notebook the most important parts of the material in the lesson and, first of all, what the teacher is writing on the board. These records may contain the following information:

- raw materials (name, chemical composition, name of operations that prepare raw materials for use in this production);
- chemical reactions and their conditions underlying the production process (name of reactions, their equations, list of reaction conditions);
- the scheme of the production process (name of the stages, the name of the main equipment);
- general principles of production;
- the importance of production in the national economy (list of industries in which the finished product is used, the general tariff for the importance of production).

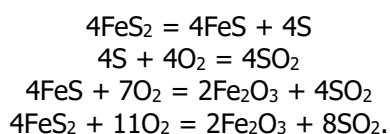
For example, it is expedient to explain the production of sulfuric acid in the following form: [5-6].

Sulfuric acid production

1. The raw material is ordinary iron pile (FeS_2), flotation pile. Flotation, crushing.

2. Chemical reactions that take place in production:

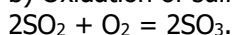
Burning Kolchedan:



The temperature is close to 850° .

The air is 1.6 times larger than the reaction equation.

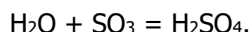
b) Oxidation of sulfite anhydride to sulfur dioxide.



Temperature 600 ° -450 °.

Vanadium catalyst (V₂O₅).

c) Absorption of sulfur dioxide into water:



98% soluble in sulfuric acid.

3. Production process:

a) Production of sulfuric anhydride (burning of puddles in a mechanical furnace, purification of gases in electrostatic precipitators);

b) oxidation of sulfite anhydride to sulfur dioxide (additional purification of mixtures in gas washing towers and electrostatic precipitators, toxic catalysts; drying in a gas drying tower; heating of gas in a heat exchanger; oxidation of SO₂ in contact apparatus to SO₃; cooling);

c) Absorption of sulfur dioxide in absorption towers.

4. The general principles of sulfuric acid production are related to other industries, raw materials: enrichment, mechanization, electrification, continuous flow, optimal surface area of reactants, use of optimal temperatures, use of countercurrents and catalysts.

5. The role of sulfuric acid production in the national economy. There is not a single manufacturing plant that does not use sulfuric acid. Sulfuric acid plays a huge role in the chemicalization of the country.

In grade VIII, students organize the production of hydrochloric acid by the synthetic method and the production of sulfuric acid by the contact method. This is the beginning of introducing students to the heavy chemical industry, which is crucial in the chemicalization of the country's economy. In the process of organizing sulfuric acid and hydrochloric acid, a basis is created to acquaint students with the general scientific principles of chemical production, ie: phasing of the production process, continuous flow, countercurrent, optimal temperatures, use of catalysts, etc.

We will review the content of the lessons to introduce students to the production of sulfuric acid.

Sulfuric acid is of great importance in the chemicalization of the national economy, as it is used in almost all industries. Therefore, acquainting students with the production and use of sulfuric acid allows them to explain the issues of great importance for becoming a polytechnic - the basic chemical industry, the chemicalization of the national economy, the importance of sulfuric acid production in the national economy.

Students will be introduced to the contact method of sulfuric acid formation only, as it is not intended to introduce the essence of the tower method of sulfuric acid formation, however, this method is considered to be obsolete from a spiritual and scientific point of view and is not included in the program. students can be given detailed information in chemistry circles about the creation and application of the tower method of production.

Thus, this article describes in detail the scientific and methodological basis of training future chemistry teachers to acquaint students with chemical industries and the pedagogical conditions of technological training of students.

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