

THE ROLE AND IMPORTANCE OF CHEMISTRY IN THE FIELD OF ARCHITECTURE AND CONSTRUCTION

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Abstract

This article discusses the teaching of the discipline of chemistry to students of construction engineering specialties. Studying this course will help to form and develop students' intellectual abilities in the field of chemistry and experience in their application. The combination of traditional teaching methods with mini-research is aimed at the formation of chemical concepts, research skills, and the improvement of professional competencies.

Keywords: chemistry in construction, chemical technologies, inorganic and organic chemistry, corrosion of metals, corrosion of concrete and mineral materials.

Introduction

Currently, chemistry is a powerful lever of technological progress, a source of well-being and one of the foundations on which human civilization is based. Look around and you will find plenty of evidence that modern chemistry has penetrated into all branches of the national economy. This applies to clothing, food, pharmaceuticals, electrical insulation materials, organic glass and, of course, building materials.

The development of modern technology is impossible without modern materials, and the creation of modern materials is impossible without knowledge of the structure and properties of substances, i.e. knowledge of chemistry.

The role of chemistry in the development of microelectronics, optoelectronics, wireless technologies and semiconductor technology is undeniable. A deep understanding of the laws of chemistry allows specialists in these industries not only to improve existing ones, but also to create fundamentally new processes, devices and materials. Therefore, chemistry is an important discipline for students of technical universities. Chemistry courses, along with other general education disciplines, form the basis of the theoretical training of engineers and serve as a core foundation.

Within the framework of this discipline, university students can get acquainted in the most positive way with the possibilities of modern chemical technology to solve their future professional tasks. Not only a general chemical culture is being formed, but also a culture of research and innovation.

The purpose of studying chemistry for students specializing in the field of construction is to form a system of chemical knowledge and experience in their application. The study of



chemistry in construction specialties is the formation of a system of chemical knowledge and experience in their application, as well as the development of chemical thinking so that future specialists can solve chemical and technical problems in their professional activities.

The tasks of chemical education in technical universities are as follows:

- acquisition of chemical knowledge based on the most important laws of modern chemistry to explain natural phenomena and understand the essence of chemistry;
- understanding the essence of technical processes related to the processing and application of metals, glass, plastics and other building materials, which are based on the most important laws of modern chemistry to explain natural phenomena;
- production and application of metals, glass, plastics and other building materials, inorganic and organic binders;
- formation of students' scientific worldview and understanding of the importance of the chemical scientific method for their perception of the world around them;
- formation of students' rational thinking, the ability to analyze and systematize data obtained during chemical experiments and problem solving;
- the ability to analyze and systematize data obtained during chemical experiments and problem solving;
- development of independent work skills in order to acquire new knowledge for future professional activities.

Without using the achievements of chemical science, it is difficult to imagine the modern development of industry and the national economy, the solution of environmental problems of environmental protection. In this regard, chemistry plays an important role in the production of materials in architecture and construction. In this regard, the introduction of a modern technological version of chemical production and the further development of bachelor's degree knowledge in this area are envisaged in higher educational institutions.

The requirements for modern civil engineers are constantly changing, and the amount of necessary knowledge, on the contrary, is growing. Building a society requires highly specialized engineers who are able to actively and professionally participate in the reconstruction and construction of administrative and residential buildings of agricultural facilities. There are special requirements for young engineers in construction. In particular, these are complex technical thinking, logic, the ability to quickly make the right technical decisions, good theoretical knowledge, and a rational understanding of not only the problems of designing and building facilities, but also the environmental problems of modern society. Chemistry for students of construction specialties of technical universities is, on the one hand, a fundamental, and on the other - a non-core discipline. Today, the main form of interaction between teachers and students is laboratory classes, group and individual consultations, and educational conferences. Special importance is attached when working on the topics "Chemistry of metals", "Corrosion of metals", "Electrochemistry", "Corrosion of concrete and mineral materials" All educational information and materials for preliminary control of students' knowledge are available on electronic media.



In practice, special attention should always be paid to the practical application of specific fields of chemistry. For example, it is important to study the chemical composition of groundwater in the design process. Groundwater of a certain chemical composition always affects building structures and causes corrosion (increased carbon dioxide content in water contributes to carbon dioxide corrosion of concrete, increased oxygen content increases the rate of corrosion of metal structures). Therefore, the sections "Corrosion of metals and alloys", "Corrosion of concrete", "Anti-corrosion measures" and "Problems of acid rain in construction" are of particular importance.

Construction chemistry is a whole range of product varieties designed to change the chemical composition of building materials, improve their performance characteristics, and increase the service life of the finished object.

New information technologies open up completely new technological learning options. They are aimed at achieving the following goals:

- formation of the personality of the information society;
- development of communication skills;
- formation of research skills, skills on their own make optimal decisions[2].

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Chemistry is one of the few disciplines in which lecture experiments are integrated into the educational process.

Lectures play an essential role in the formation of chemical concepts and are therefore of great importance in chemical education. The main task is to teach students how to apply the basic laws of chemistry to various objects of professional activity and solve technical problems, including non-standard situations[3].

Lectures as a form of educational work are presented in multimedia, which allows discussing the most difficult issues of the topics under consideration with the involvement of students in the discussion. In our opinion, this ensures the transition from passive information consumption by students to their active one. The teachers of the department include methodological tools aimed at the development of intellectual abilities:

- video lectures and video seminars, as they help in creating a problematic situation, activate cognitive activity, broaden the horizons of students;
- multimedia presentations that contribute to the activation of cognitive activity;
- electronic test tasks for cycles of chemical disciplines, used as a means of self-control, control of chemical knowledge and skills;
- electronic textbooks, which provide tasks for students' independent work;
- electronic textbooks and electronic educational and methodological complexes, which are sources of additional information.



As practice shows, in modern lectures on the course "Chemistry" there is a transition from the descriptive to the comparative method, as well as a significant increase in the use of problem-based search methods of presentation of the material, as well as informative methods.

The use of a combined training format, taking into account multi-level tasks, is aimed at consolidating chemical knowledge in practical classes. Throughout the course of study, the intellectual level of students increases and the quality of chemical education improves.

Its essence lies in the fact that the study of chemistry contributes to the perception of the surrounding reality, and knowledge of its laws is inextricably linked with the practical activities of future graduates of the construction specialty[1].

Thus, the development of students' intellectual capabilities is the primary task of high—quality training of a future competent specialist in a technical university. At the same time, improving chemistry education is impossible without organizing an integral process of intellectual development, allowing students to penetrate into the essence of the material being studied, accumulate experience in mental activity and use the knowledge gained as a means of further development.

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