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A ROLE OF SEMINAR EMPLOYMENTS IS IN INCREASE OF EFFICIENCY OF CHEMISTRY EDUCATING

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Summary. It is shown that for the increase of efficiency of educating of chemistry, for development of creative intellection of students irreplaceable to become role of seminar employment. Concrete examples of educational chemical problem are made for a collective debatable discussion. Organization of her decision on seminar employment is considered.
Key words: seminar employments, educating, problems.

РОЛЬ СЕМИНАРСКИХ ЗАНЯТИЙ В ПОВЫШЕНИИ ЭФФЕКТИВНОСТИ ОБУЧЕНИЯ ХИМИИ

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Аннотация. Показано, что для повышения эффективности обучения химии, для развития творческой умственной деятельности студентов незаменимой становиться роль семинарского занятия. Приведены конкретные примеры учебной химической проблемы для коллективного дискуссионного обсуждения. Рассмотрена организация ее решения на семинарском занятии.
Ключевые слова: семинарские занятия, обучение, проблемы

Experience in the use of test technologies has shown that this significantly reduces one of the most important components of a student's live communication with the teacher. The student's ability to speak aloud is

minimized to a minimum. In these circumstances, the role of the seminar becomes indispensable for the development of creative mental activity, the ability to formulate and express own opinion. They acquire the skills of independent thinking, analysis and generalization of facts, master logical reasoning, master the art of oral presentation of material and the protection of scientific provisions and conclusions. Students' knowledge is transformed into beliefs at seminar classes.

In accordance with the theory of gradual formation of mental activity, the seminar is given the stage of vocal speech. Any new knowledge, passing through the stage of motivation and acquaintance at lectures and material action in the laboratory, naturally and scientifically justified enters the stage of vocal speech at the seminar classes [1]. Teaching a student to speak is a challenge that can be solved through a methodologically competent seminar.

In our opinion, the author [2] offers a rather attractive method of group discussion of scientific issues at seminars. The lecturer acquaints students with a new portion of program material (motivation, familiarization), then students perform laboratory work on the same topic. It is suggested to discuss the acquired material at the seminar. This can be solving a calculation task that contains a problem in the source data or in the calculation results; discussing problems encountered in observation of a demonstration experiment or during performance of laboratory experiments.

At the initial stages of problem learning, the teacher points the problem to the student (contradictions in knowledge, lack of data to solve the question, etc.) and demonstrates solution of such a problem situation.

Here we propose the following example of such an educational chemical problem and the organization of its solution at a seminar class. In the study of redox reactions, the teacher asks students to draw up the equation for the reaction of the interaction of potassium permanganate with hydrogen peroxide. Students draw up the oxidation-reduction reaction equations independently and complete the reaction equation in the form:

$2KMnO_4 + 5H_2O_2 + 3H_2SO_4 = 2MnSO_4 + 5O_2 + K_2SO_4 + 8H_2O$.

The teacher notes that he has completely different reaction coefficients, and writes his own equation:

$2KMnO_4 + 7H_2O_2 + 3H_2SO_4 = 2MnSO_4 + 6O_2 + K_2SO_4 + 10H_2O$.

There is a problematic situation established. Who is right and who is wrong?

After analyzing and comparing these equations, the teacher writes another equation on the board:

$2KMnO_4 + 9H_2O_2 + 3H_2SO_4 = 2MnSO_4 + 7O_2 + K_2SO_4 + 12H_2O$.

In this equation, the electronic balance is also completely maintained. What is the reason of this phenomenon that the same reaction can be balanced in different ways?

As the experience shows usually some of the students finds the correct solution. The reaction of potassium permanganate and hydrogen peroxide may be affected by the H_2O_2 decay.

To continue discussion, it is a good idea to talk about environmentally friendly oxidants (oxygen, ozone, hydrogen peroxide) and reduction agents (water, hydrogen peroxide, hydrogen) comparing with environmentally hazardous pollutants such as potassium permanganate.

The raised problems should be significant for students and related to their future activities in specialty.

The ideas exchange coming together from different points of view demonstrates the creative active character of thinking and expresses the most fully the goals of the modern seminars.

The content of a seminar class, lecture or laboratory workshop clearly demonstrates its impact on the organization of training, which in turn largely determines the content selection for the seminars.

One of the most important conditions for increasing the effectiveness of training is the scientific organization of the educational process and, in particular, the interconnection of lectures, laboratory, seminar and non-auditorys forms of training. The student's acquisition of new knowledge or their formation, must go through the entire sequence of listed organizational forms.

In the context of reducing the total number of hours for studying chemistry, it is practiced to master individual sections of the course in only one of these forms of classes. For example, the topic of "Hydrolysis of salts" is often studied in laboratory classes, "Solubility product" – in seminars. Our observations prove the correctness of psychologists' assertion that the omission of any stage in the formation of mental actions leads to defective knowledge.

The role of the seminar in the educational process is not only to solve tasks and problems, but also to consolidate and test knowledge. In some cases, the teacher is forced to use the seminar for these purposes, but he is always able to organize the seminar in such a way that students actively participate in it because it is very interesting for them.

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