

Improving The Methodology Of Solving Chemistry Problems On The Basis Of Interdisciplinarity

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ABSTRACT

The issue of methods and methods of interdisciplinary implementation of problem solving in chemistry is considered to be one of the general problems of improving the methods of teaching chemistry. Interdisciplinary integration serves to master the content of academic subjects by implementing it in future chemistry teachers in "Practical training of the science of chemical calculation" in pedagogical universities. At the same time, it is necessary to more fully determine the didactic possibilities of interdisciplinary integration, to determine their functions in teaching, and thus to support future chemistry teachers to effectively use interdisciplinary integration in the teaching process.

Keywords:

Chemistry, teaching chemistry, teaching process

Integration comes from the Latin word integration to restore, fill, integer. The introduction of an integrated system into education will help more in educating young people who have a holistic worldview, the ability to independently organize existing knowledge, and have the ability to take an unconventional approach to solving various problems. What is the essence of integration of education? The concept of education-related integration has two meanings:

1) To create a good idea of the surrounding world in the student (integration is seen as an educational goal here).

2) Finding a common platform for the convergence of subject knowledge (here, an integration-educational tool).

The simplest form of connection that creates the simplest knowledge about nature or an

object is a local imagination limited to a certain place or concept. This connection is isolated from other knowledge, so it provides the simplest mental activity. This is typical of junior high school age. Concepts belonging to a system are the simplest systematic concepts. They are formed on the basis of studying a topic, subject or event. Knowledge of a subject, the selection of new evidence and concepts is carried out by comparing them with existing knowledge. The simplest generalization of knowledge takes place, but it would be the same if the acquired knowledge is connected with the knowledge that is close to it.

In order to prepare information for an interdisciplinary integrated lesson, first of all, information from auxiliary subjects is systematically analyzed. Extracted information

is placed in accordance with the subject plan and in accordance with the content.

chemistry + biology - meeting of substances in the plant and animal organism, their importance, cell composition, chemical structure of tissues (blood, bone, muscle), metabolism in the body, protein biosynthesis; chemistry + physics - substance structure, description of substances, solutions, electrolysis, nuclear reactions, semiconductors, chemical kinetics, catalysis, thermochemistry; chemistry + geography - natural reserves of substances, mines, production enterprises;

In the process of studying inorganic chemistry, it is the sacred duty of the chemistry teacher to use the ready-made knowledge and skills of the students, to ensure their formation, to organize the communication between man and nature in accordance with the purpose. In turn, it will be necessary for teachers of other subjects to use the topics of chemistry in their activities.

For example, if we take the topic "Importance of water in man and nature" in the 7th grade chemistry class. In this lesson, the teacher can use the integration of the chemistry lesson with

Metals	Distribution in nature
Potassium salts	Tubokat, Kashkadarya region, Khojaikon mines, Surkhandarya region
Sodium salts	Kashkadarya region Tubokat, Surkhandarya region Khojaikon, Borsakelmas, Boybichakon, Akkala mines

Below we present examples of problems aimed at the implementation of the integration of knowledge about nature between chemistry and mathematics.

Issue 1. In one minute, a person absorbs about 250 ml of oxygen by breathing. How much oxygen does a person need to breathe for 1 hour or 1 day? What should be done to increase it and prevent air pollution? If solving the problem solves the quantitative side of the problem, finding answers to the above questions through conversation and free communication (for example, growing flowers, changing the air in the classroom often, etc.) will lead to the development of environmental culture in students.

Issue 2. When the car moves at normal speed, it pollutes the air less with gases, and when it

biology and geography, ecology, economics. The lesson is organized in an interactive way. The groups are named as laboratories based on the subjects. The chemical importance of water in the chemistry laboratory, the importance of water for nature and man in the biology laboratory, the spread of water in the geography laboratory, the consequences of water pollution in the ecology laboratory, the economics laboratory, and the use of water in industry, economy and life are the students' own opinions. development, serves in the development of communicative, informational competences. Connection of geography with chemistry. Information about the distribution of chemical elements and studied substances will be given continuously. From this point of view, it can be seen that the science of chemistry is related to the science of geography.

For example, in the 9th grade, we will consider some cases aimed at studying the compounds of sodium and potassium metals, teaching topics about the raw materials of the metallurgical industry.

moves at low speed, it emits 3 times more gas. If 3 cars stop first and 4 cars stop to let a passenger pass, how much will the air pollution increase?

Issue 3. For trout fish, the oxygen content of the water should not be less than 2 mg/l. If the water content is 1.6 mg/l, fish will die. Find how many mg/l of oxygen the fish needs to survive.

Ignorance of mathematical concepts or confused concepts about them do not allow to fully and deeply master the concepts of chemistry. For example, in the 10-11th grade, it is appropriate to solve the following problems by applying the knowledge gained from mathematics and physics in chemistry lessons.

Issue 4. Find the radius and volume of the potassium atom. To solve this problem,

students should refer to the knowledge they have acquired in mathematics, physics, and chemistry, that is:

From the physics course $\rho = m / V$ or $V = m / \rho$ (1)

From the chemistry course $n = M / N$ (2) $6,02 \cdot 10^{23}$ (Avogadro's number)

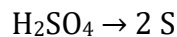
Agar (2) \rightarrow (1); $V = m / \rho = M / \rho N$

$V = 4 / 3\pi r^3$ from this $r = \sqrt[3]{3/4\pi}$ found through

Chemical problems solved by the method of proportions.

Issue 5. $12,04 \cdot 10^{21}$ Find the mass of sulfuric acid with hydrogen atoms.

Solving. We use the following stoichiometric law in working out this problem:



$$98 \text{ g } \underline{\hspace{1cm}} 12,04 \cdot 10^{23}$$

$$X \text{ g } \underline{\hspace{1cm}} 0,1204 \cdot 10^{23} \quad X = 0,98r$$

Connection of chemistry with biology (agrochemistry) and mathematics

Mineral fertilizers are very important for agricultural crops.

Nitrogen deficiency has a negative effect on plant development and productivity. Find out which mineral fertilizer contains the most nutrients.

NaNO ₃	KNO ₃	NH ₄ NO ₃
		

NaNO ₃	KNO ₃	NH ₄ NO ₃
NaNO ₃ = 23+14+48 =85 w% = 14/85*100% = 16.4% So, there is 16.4% nutrient element	KNO ₃ =39+14+48 =101 w% = 14/101*100% = 13.9% So, there is 13.9% nutrient element	NH ₄ NO ₃ =14+4+14+48 = 80 w% = 28/80*100% = 35% So, there is 35% nutrient element

Examples and problems for independent solution:

Problem 1: How many water molecules are there in a glass of water (200 ml).

Issue 2: The amount of various toxic substances in the air does not pose a threat to human health if it does not exceed the permissible concentration.

1m³ in the air 0,085 mg NO₂; 3,0 mg CO; 0,05 mg SO₂; 0,08 mg H₂S allowed to be. Average per day for a person to breathe 10 m³ air is needed. This volume is in the air NO₂, CO, SO₂, H₂S calculate the allowable amount of ?

Problem 3: If bones make up 20% of the human body mass, and the mass fraction of calcium fluoride in bones is 0.3%, determine the mass

of fluoride in the body of a person weighing 70 kg?

Issue 4: When bitten by a snake, in cases where there are no special serums, potassium permanganate solution can be used as first aid. For this, 0.5-1 ml of 1% potassium permanganate solution is sent to the bitten place through a syringe. Density 1.006 g/ml Calculate the mass of potassium permanganate and the volume of water needed to prepare 75 ml of such a solution.

In conclusion, it can be said that in chemistry education, the study of the implementation of interdisciplinarity, including the theoretical analysis of chemistry, physics, and mathematics textbooks, does not provide continuity (in the sense of time) between these

disciplines. it was found that the amount of environmental issues in mathematics textbooks, and the amount of physics and applied issues in higher grades has decreased. For the purpose of integration of these sciences: issues of ecological, physical, chemical content, to produce new generations of textbooks; It is desirable to give special importance to the formation of widely used concepts, modeling skills, functional connection, equation solving skills and bring them to the level of competence.

References:

1. Sh.X.Shomurotova Sh.B.Farmonova N.I.Kamolova, S.A.Movlonova –Improving the Methodology of Teaching the role of Metals in Biochemical Processes using Pedagogical Technologies||. *Engineering a Management TEST*. Volume 83. May-June 2020. Page: 26638-26645 Scopus.
2. Фармонова Ш.Б. Кимёдан масалалар ечиш методикаси. Ўқув қўлланма. Тошкент -2020. -Б. -140.
3. Ximatova, X. (2024). Преподавание наук в цифровую эпоху: проблемы и решения. *Modern Science and Research*, 3(1), 1-3.
4. Meliboyeva G.S. Kimyoni o'qitishda zamonaviy texnologiyalar 5110300-kimy o'qitish metodikasi bakalavriat ta'lim yo'nalishi talabalari uchun o'quv qo'llanma
5. Formanova, S. B. (2021). Application of Pedagogical Technologies to the Topics of the Metals Department. *Annals of the Romanian Society for Cell Biology*, 5499-5509.
6. Shomurotova, S. X. (2023). Kimyo fanidan masalalar yechish orqali o'quvchilarda bilish darajasini oshirish. *o'zbekistonda fanlararo innovatsiyalar va ilmiy tadqiqotlar jurnali*, 2(17), 541-544.
7. Saydaxmetova, S. R., & qizi Pardayeva, F. S. (2023). Kimyoviy elementlarning inson organizmidagi roli. *golden brain*, 1(31), 30-36.