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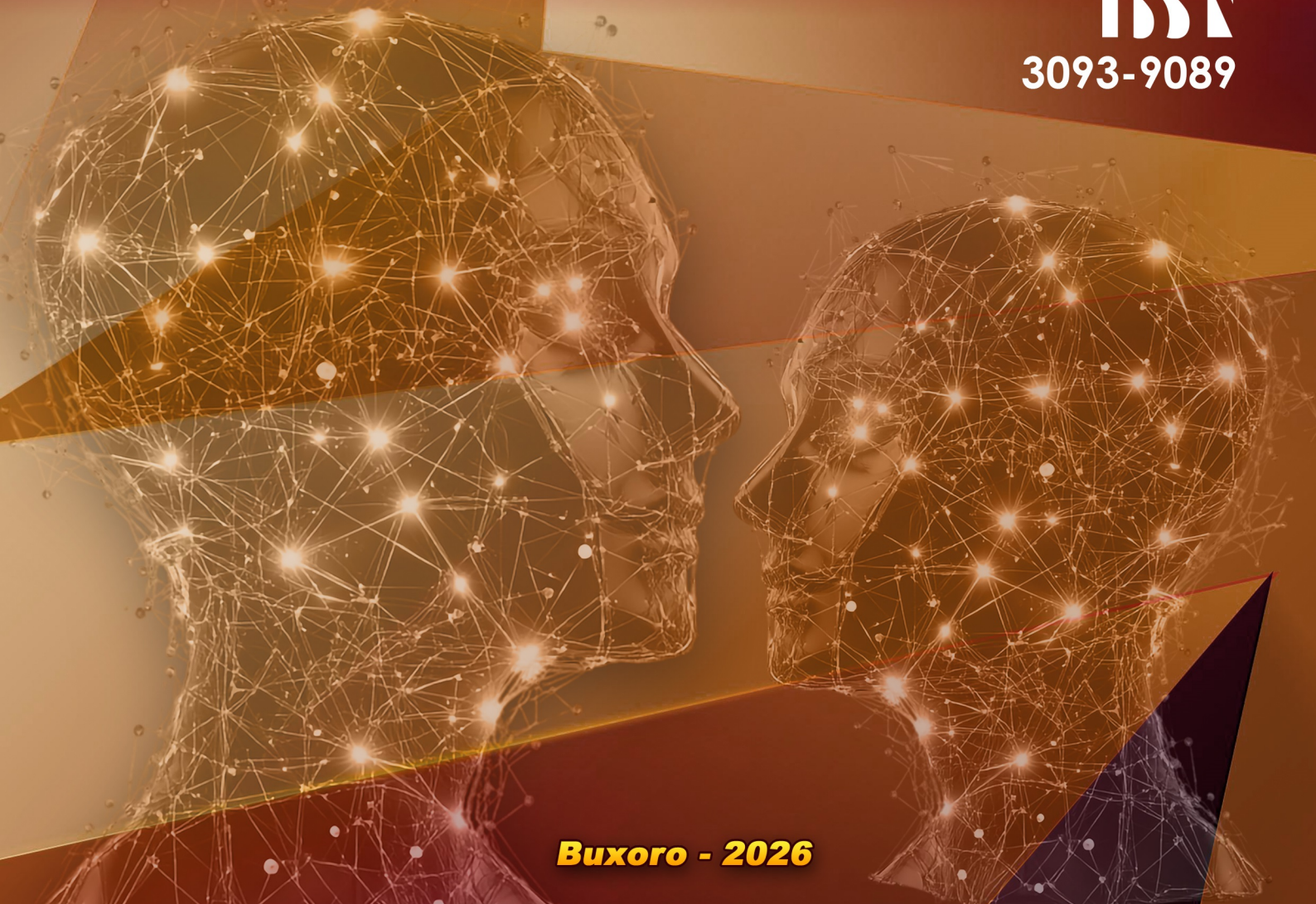

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Jurnal O‘zbekiston Respublikasi Buxoro viloyat Axborot va Ommaviy komunikatsiyalar boshqarmasi tomonidan 2025-yil 26-dekabrdagi №1273056 sonli guvohnoma bilan ro‘yxatga olingan

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METHODOLOGY FOR USING EDUCATIONAL MATERIALS ON NATURAL RESOURCES IN THEORETICAL CLASSES

Abstract. *The use of modern technologies and teaching methods in the teaching of topics related to natural resources in chemistry lessons serves to increase students' interest in the subject, a deeper understanding of the practical content of the educational materials given in the topics. In the classes, it is possible to use information about the natural resources of territories corresponding to the topics, explain chemical concepts using the example of natural resources and processes in the environment, and connect theoretical knowledge with practical life. Currently, in the methodology and practice of teaching chemistry, much attention is paid to the use of modern approaches in the organization of the educational process. Using modern approaches, the use of information on the natural resources of Karakalpakstan will help students get acquainted with information about the geographical location, natural resources, environmental problems, and economic potential of the region.*

Key words*: Chemistry teaching methods, teaching methods, educational programs, chemical theories, chemical data, chemical elements.*

Аннотация*. Использование современных технологий и методов обучения при преподавании тем, связанных с природными ресурсами на уроках химии, способствует повышению интереса учащихся к предмету и более глубокому пониманию практического содержания учебных материалов, представленных в данных темах. На занятиях возможно использование информации о природных ресурсах территорий, соответствующих изучаемым темам, объяснение химических понятий на примере природных ресурсов и процессов, происходящих в окружающей среде, а также установление связи теоретических знаний с практической жизнью. В настоящее время в методике и практике преподавания химии особое внимание уделяется применению современных подходов в организации образовательного процесса. Использование современных подходов, а также информации о природных ресурсах Каракалпакстана, способствует ознакомлению учащихся с географическим положением региона, его природными ресурсами, экологическими проблемами и экономическим потенциалом.*

Ключевые слова*: методы преподавания химии, методы обучения, образовательные программы, химические теории, химические данные, химические элементы*

Annotatsiya*. Kimyo darslarida dasturda berilgan mavzularni o‘qitishda tabiiy zaxiralarga oid o‘quv materiallardan foydalanishda zamonaviy texnologiya va o‘qitish metodlardan foydalanish, o‘quvchilarning fanga bo‘lgan qiziqishini oshirishga, mavzularda berilgan o‘quv materiallar amaliy mazmuni chuqurroq tushunishga xizmat qiladi. Mashg‘ulotarda mavzularga mos hududlarning tabiiy zaxiralariga doir ma’lumotlaridan foydalanish, atrof-muhitdagi tabiiy resurslar va jarayonlar misolida kimyoviy tushunchalarni tushuntirish, nazariy bilimlarni amaliy hayot bilan bog‘lash imkonini beradi. Hozirgi vaqtda kimyo o‘qitish metodikasi va amaliyotida ta’lim jarayonini tashkil etishda zamonaviy yondashuvlardan foydalanishga keng e’tibor qaratilmoqda. Zamonaviy yondashuvlardan foydalanib, Qoraqalpog‘iston tabiiy zaxiralariga doir ma’lumotlardan foydalanish o‘quvchilarga hududning geografik joylashuvi, tabiiy resurslari, ekologik muammolari va iqtisodiy salohiyati haqidagi ma’lumotlar bilan tanishishlariga yordam beradi.*

Kalit so‘zlar*: Chemistry teaching methods, teaching methods, educational programs, chemical theories, chemical data, chemical elements.*

Introduction. The following pedagogical possibilities exist for the use of educational materials on the natural resources of territories in teaching the theoretical foundations of chemistry: Also, the study of rare natural resources of Karakalpakstan - mineral salts, oil and gas deposits, soil properties, water resources, and other resources in the context of chemistry lessons not only strengthens students'

theoretical knowledge, but also allows them to understand local problems and understand the importance of chemistry in the national economy in solving them.

Understanding the practical significance of knowledge: Students understand the practical application of theoretical knowledge in real life using the example of the region in which they live.

Increased motivation: Information about familiar environments and local problems increases students' interest

Development of scientific literacy: skills of analyzing local problems from a scientific point of view are formed, which serve to develop research skills for their elimination in the future.

Cultivating social and scientific responsibility: Students will be able to understand local problems and their role in solving them, and the development of social and ecological culture competencies will be achieved.

Establishing interdisciplinary connections: It becomes possible to connect chemistry with geography, biology, ecology, and other sciences[1].

The use of educational materials on the natural resources of Karakalpakstan in theoretical chemistry classes contributes to increasing students' interest in the subject and a deeper understanding of the topics. Explanation of chemical concepts using the example of natural resources, i.e., natural resources and processes in the environment, makes it possible to connect theoretical knowledge with practical life.

The use of materials on the natural resources of Karakalpakstan in theoretical classes based on Bloom's taxonomy in chemistry lessons can be carried out in the following order:

Knowledge: Know the existing natural reserves of Karakalpakstan, the location of deposits, the names and composition of minerals extracted from them.

Understanding: Understanding the composition of chemical elements obtained from natural reserves in the territory of Karakalpakstan, their production, reactions with their participation

Application: Compiling chemical equations and performing calculations based on local raw materials, applying them in practice in classes

Analysis: Conducting experiments on the structural composition of soil or water samples in Karakalpakstan during classes and analyzing their composition.

Synthesis: Proposing various solutions based on the perspectives of chemistry to solve local problems

Evaluation: Critical assessment of the chemical aspects of environmental problems in Karakalpakstan

In chemistry lessons, we will familiarize students with the possibilities of using mobile software applications and innovative technologies in the use of educational materials on the natural resources of the regions of the Republic of Karakalpakstan. In chemistry lessons, we will familiarize students with the possibilities of using mobile software applications and innovative technologies in the use of educational materials on the natural resources of the regions of the Republic of Karakalpakstan.

Materials and methods

Topic: Calcium and Magnesium[2]

1. Scientific (knowledge-oriented) goal:

Students will learn about the position of calcium and magnesium in the periodic table, their atomic structure, physical and chemical properties, their reactions with water, oxygen, and acids, as well as the structure and applications of basic compounds such as CaCO3, Ca(OH)2, and MgCl2.

2. Educational goal:

The student forms an ecological and healthy lifestyle culture by observing safety rules when working with calcium and magnesium substances, understanding their impact on human health and the environment, as well as understanding the importance of clean water and soil.

3. Developmental Goal:

The student compares and analyzes the properties of calcium and magnesium, balances reactions, draws conclusions, and develops independent thinking and problem-solving skills based on practical tasks (Table 2.1).

2.1-table

№	STEPS OF THE LESSON	DURATION
1.	Organizing part	3 minute
2.	Repeat passed topic	10 minute
3.	New lesson topic description	15 minute
4.	Strengthening the new topic	10 minute
5.	Student rating	5 minute
6.	Assign homework	2 minute

Students can be asked questions and test questions on the covered topic. In this case, students are divided into two groups and work on the test in agreement with the group, both groups are given the same questions, and after working, the groups exchange test results[3].

General characteristics of calcium and magnesium, their biological significance, role in the body.

Main functions of calcium and magnesium:

3. The interaction of calcium and magnesium.

Results and discussions

General characteristics of calcium and magnesium, their biological significance, role in the body.

Calcium and magnesium are essential macroelements for the human body. They mainly ensure the healthy functioning of bones, muscles, the heart, the nervous system, and other vital systems. Although these minerals are present in the body in very small quantities, their effects are very significant. Calcium is the most common mineral in the body. About 99% of it is stored in bones and teeth. The remaining 1% performs important biological functions in blood, muscle, and other tissues. After students familiarize themselves with the educational materials provided in the textbook, they can use the following additional materials using a mobile application to ensure that these educational materials are understandable and remembered (Figure 2.1)[4].

Chemical symbol: Ca

Latin name: Calcium

Atomic number: 20

Period: 4

Relative atomic mass: 40.07

Group: 2.A

Oxidation state: +2, 0,

Electron configuration: $4S^2$

Aggregation state: Solid

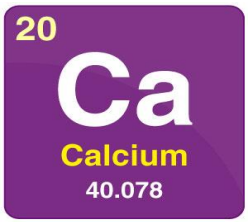
CAS number: 7440-09-7

Discovored: 1808

Ionization energy [eV]: 6.11

Electronegativity: 1.00

Density: 1,55 g /sm^3



2.1-rasm: Ca elementi

The main functions of calcium are:

Ensures the strength of bones and teeth;

Necessary for muscle contraction;

Participates in nerve impulse transmission;

Plays an important role in blood clotting.

Products rich in calcium: Milk and dairy products (milk, yogurt, cheese), fish (locon, sardines), green leafy vegetables (broccoli, spinach), almonds and other nuts.

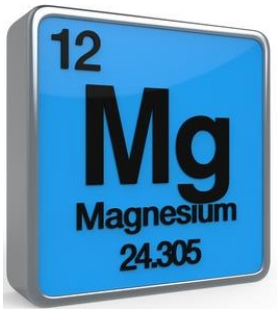
Calcium deficiency can lead to bone fragility, osteoporosis, and muscle spasms. Excess leads to problems such as kidney stones and heart rhythm disorders.

Magnesium is the 4th most common mineral in the body and participates in many enzymatic reactions. It is found mainly in bones, muscle tissue, and blood plasma.

The main functions of magnesium are:
Energy production (participates in ATP formation);
Control of nerve impulses;
Maintaining normal heart rhythm;
Necessary for muscle relaxation.

Products rich in magnesium: nuts (almonds, peanuts), whole grain products, bananas, avocados, greens (spinach, parsley), legumes (beans, peas).

Magnesium deficiency manifests as nervousness, fatigue, muscle cramps, and heart rhythm disturbances. Excess leads to diarrhea, low blood pressure, and other problems. After familiarization with information about Mg in the textbook, using mobile software applications as additional educational materials. The use of the following additional materials can make the lesson more interesting, and the use of such information can serve to increase students' interest in the subject (figure 2.2). After familiarization with information about Mg in the textbook, using mobile software applications as additional educational materials[5].



Summary of Magnesium:
Chemical symbol: Mg
Atomic number: 12
Group: Second group, alkaline earth metals
Period: III period
Characteristics: Light, silvery-white, flexible metal.
Natural isotopes: 24Mg, 25Mg, 26Mg
Artificial isotopes: 23Mg, 27Mg, 28Mg

3. Interaction of calcium and magnesium.

Calcium and magnesium work interconnectedly in the body. For example, calcium is necessary for muscle contraction, while their relaxation occurs under the influence of magnesium. Also, the balance of these two minerals is very important for healthy heart function. Their disproportionate consumption can lead to various disorders in the functioning of the bones, heart, and nervous system.

Calcium and magnesium are important minerals for the human body. They play an important role in the musculoskeletal system, heart, nervous system, and metabolic processes. Consuming them in sufficient quantities in daily meals is an integral part of a healthy lifestyle. Therefore, it is necessary to know their sources well and observe a rational diet. The balance of these minerals in the body is a guarantee of overall health[6].

Reinforce topic

After explaining the topic to the students, I use the "Pinboard" method to reinforce the new topic. The "Pinboard" method contributes to increasing students' activity in the lesson, developing independent thinking and the ability to reason fully express their thoughts.

Rules of application:

Students are divided into small groups. Each group writes their thoughts on batman paper, attaches them, and places them on the pinboard. Thoughts are read aloud, one teacher from the groups complements or discusses them. At the final stage, a general conclusion is drawn by the students.

Creates an opportunity for students to express their thoughts freely, is especially useful for visual and kinesthetic students, each student actively participates in the lesson, creates a lively and creative atmosphere in the lesson[7].

“Pinboard” method

	Names of metal	reaction with water	reaction with oxygen	reaction with nitric acid
	K			
	Na			

	Ca			
	Mg			

Conclusion

The use of mobile applications in explaining educational materials on the natural resources of Karakalpakstan in theoretical chemistry classes serves as an important tool for organizing the educational process more effectively and interestingly. The use of mobile applications in chemistry lessons creates wide opportunities. Mobile software applications allow students to fully understand the content of chemical phenomena and reactions by visualizing complex chemical processes, working with 3D models, and conducting interactive experiments through smartphones and tablets.

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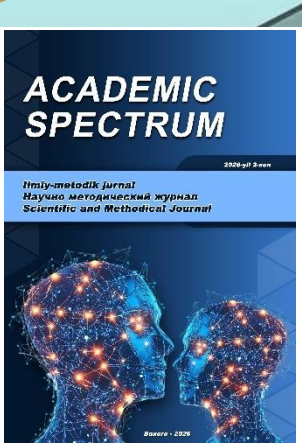

“ACADEMIC SPECTRUM” ILMIY METODIK JURNALI UCHUN MAQOLALARNI RASMIYLASHTIRISH TALABLARI

“ACADEMIC SPECTRUM” ilmiy jurnali mualliflari diqqatiga!

1. “ACADEMIC SPECTRUM” ilmiy jurnali ilmiy maqolalarni o’zbek, rus va ingliz tillarida chop etadi.

2. E’lon qilinadigan maqolalarga bo’lgan asosiy talablar:

- ishning dolzarbligi va ilmiy yangiligi;
- maqolaning hajmi: adabiyotlar ro’yxati, chizma va jadvallar inobatga olingan holatda 3-8 betgacha;
- maqola nomi, annotatsiya (50-60 ta so’z) va tayanch so’zlar (8-10 ta) ingliz, o’zbek va rus tillarida keltiriladi.

3. Maqola boshida mavzu, muallifning F.I.O. (to’liq yozilishi kerak), mualliflar bir nechta bo’lsa, ularning har biri haqida to’liq ma’lumotlar berilishi shart, tashkilot, shahar, mamlakat, muallifning e-maili ko’rsatiladi. Matnda kirish qismi, tadqiqot obyekti va qo’llanilgan metodlar, olingan natijalar va ularning tahlili, xulosa, adabiyotlar ro’yxati, albatta, keltiriladi. Maqolada keyingi 10-15 yilda e’lon qilingan adabiyotlarga havola qilinishi tavsiya etiladi.

4. Matn uchun: Microsoft Word; Times New Roman, 12 shrift, maqola nomi bosh harflarda, interval 1,0; abzas 1,0 sm, yuqori va pastki tomon 2 sm, chap va o’ng tomon 2 sm.

5. Agar maqolaga rasm, jadval, diagramma, sxema, chizma, turli grafik belgilar kiritilgan bo’lsa, ular aniq va ravshan tasvirlanishi, qisqartmalarning to’liq izohi yozilishi lozim. Formulalar matnga maxsus kompyuter dasturlarida kiritilishi kerak.

6. Iqtibos olingan yoki foydalanilgan adabiyot satr osti izohi tarzida emas, balki maqola oxirida asosiy matndagi ketma-ketligi asosida umumiy ro’yxatda ko’rsatiladi. Matn ichidagi ko’chirmadan so’ng iqtibos olingan asarning ro’yxatdagi tartib raqami va sahifasi kvadrat qavs ichida beriladi. Bu o’rinda kitob, to’plam, monografiyalar uchun mualliflarning ism-familiyalari, manbaning to’liq nomi, nashr ko’rsatkichi (shahar, nashriyot va nashr yili) ko’rsatiladi. Jurnal maqolalari va boshqa davriy nashrlar uchun mualliflarning ism-familiyalari, maqola nomi, jurnal nomi, yili va soni, sahifa nomeri ko’rsatiladi.

7. Maqola matni kamida 70-80 % muallifning shaxsiy izlanishlari natijasiga asoslanishi lozim. Topshirilgan maqolalar “Antiplagiat” tizimi yordamida tekshiriladi.

8. Tahririyatga taqdim qilingan maqolalar tahririyat tomonidan taqrizga beriladi. Maqola taqrizdan qaytgach, agar zarur bo’lsa, barcha savol va e’tirozlar bo’yicha muallifga qayta ishlash uchun taqdim etiladi. Maqola nusxalari qaytarilmaydi.

9. Tahririyat maqolani taqrizga yuboradi, taqriz ijobiy bo’lsa maqola jurnalda chop etish uchun qabul qilinadi. Jurnalda anjuman tezislari va ma’ruzalari chop etilmaydi. E’lon qilingan materiallarning haqqoniyligiga va ko’chirilmaganligiga shaxsan muallif javobgardir.

10. Tahririyat maqolaga ayrim kichik o’zgartirishlarni kiritishi mumkin. Yuqoridagi talablarga javob bermaydigan maqolalar tahririyat tomonidan ko’rib chiqilmaydi va muallifga qaytarilmaydi.

11. Ijobiy taqriz berilgan maqola tahririyat tomonidan qabul qilingan sanaladi. Jurnal tahririyati maqola matnini qisqartirish va unga tahririy o’zgartirishlar kiritishga haqlidir.

12. Yuqoridagi talablarga javob bermaydigan maqolalar tahririyat tomonidan qabul qilinmaydi va ko’rib chiqilmaydi.

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