STUDY OF THE COMPOSITION OF SALT DEPOSITS AROUND THE QUYIMOZOR WATER POOL

Baxshilloyev Nozim Komil O'gli
is a doctoral student of Bukhara Institute of Engineering and Technology
Tel: +998-882969000 e-mail : nozimbaxshilloyev96@gmail.com
Umirov Farhod Ergashovich
Doctor of Technical Sciences, Professor of the Department of Chemical Technology, Navoi State Mining and Technology University, 210100, Navoi, Republic of Uzbekistan. e-mail:Umirov3@yandex.ru. Tel : (+998-97 322 44 35
Maxmudov Rafiq Amonovich
doctor of technical sciences, professor. Bukhara Institute of Engineering and Technology, Department of "Chemical Engineering". Tel.: +998997752742 (c), E-mail: ramakhmudov@mail.ru
Баходирова Нилуфар Баходировна
Independent researcher, Department of Chemical Technology, Navoi State Mining and Technology University, 210100, Navoi, Republic of Uzbekistan. e-mail: Nilifar2@yandex.ru. Tel.:+998-913355524

Annotatsiya: Ushbu makolada Quyimozor suv xavzalari atrofida hosil bo'lgan tuz konlarining tarkibi kimyoviy va fizik-kimyoviy taxlil usullari yordamida o'rganildi. Olingan kimyoviy taxlil natijalari mavjud tuzlar tarkibi natriy, kaliy xlorid, magniy sulfatlarga mos kelishini ko'rsatmoqda. SEM taxlili tuzning tarkibida natriy – 17,7; magniy – 18,2; xlor –24,6; va kislorod–36,9 % tashkil etishini va IK-spektrlar esa magniy, natriyning kislorod bilan va xlor, sulfatning metallar bog'lari uchrashini aniqlandi. Ushbu taxlil natijalari tarkibidagi natriy, kaliy xlor va magniy sulfat tuzlari mavjudligini va ularni foydali maqsadlarda ishlatishga tavsiyalar berildi.

Kalit so'zlar : suv, tabiiy mineral, tuz, natriy xlorid, magniy sulfat, tahlil, tarkibi, IQ spektri, SEM tahlili

Аннотация. В данной статье методами химического и физико-химического анализа изучен состав солевых отложений, образовавшихся вокруг Куймозорских водохранилищ. Результаты полученного химического анализа показывают, что состав имеющихся солей соответствует хлоридам натрия, калия и сульфатам магния. СЭМ-анализ соли содержит натрий - 17,7; магний – 18,2; хлор –24,6; а кислород составляет 36,9%, а ИК-спектры показывают, что магний и натрий встречаются со связями кислорода, хлора и сульфата

ISSN 3030-3907

металла. Результаты этого анализа показали наличие солей хлорида натрия, калия и сульфата магния и рекомендовали их использование в полезных целях.

Ключевые слова: вода, природный минерал, соль, хлорид натрия, сульфат магния, анализ, состав, ИК-спектр, СЭМ-анализ.

Annotation: In this article, the composition of salt deposits formed around Kuyimozor reservoirs was studied using chemical and physicochemical analysis methods. The results of the obtained chemical analysis show that the composition of the existing salts corresponds to sodium, potassium chloride, and magnesium sulfates. SEM analysis of salt contains sodium - 17.7; magnesium - 18.2; chlorine – 24.6; and oxygen is 36.9%, and the IR-spectra shows that magnesium and sodium meet oxygen and chlorine and sulfate metal bonds. The results of this analysis showed the presence of sodium, potassium chloride and magnesium sulfate salts and recommended their use for beneficial purposes.

Key words : Water, natural mineral, salt, sodium chloride, magnesium sulfate, analysis, composition, IR spectrum, SEM analysis

Enter. Currently, the intensive increase in the number of people in the world, the development of science and technology, the complete provision of the population's demand for quality products is one of the main tasks of the chemical industry. Uzbekistan is rich in natural mineral and salt deposits, which are rich in various chemical elements , and they are not fully utilized. The use of these salt deposits and various other resources will help to fulfill the above requirements. This will lead to the provision of cheap raw materials and a high level of development of production. The demand for the use of natural minerals and salts is increasing from year to year , and their application in various branches of the chemical industry is one of the current issues [1-4].

There are many water bodies and lakes in Uzbekistan, which over the years have increased in salinity due to the decrease in water content, leading to the formation of various inorganic salts. The extraction and processing of these salts, which are rich in sodium, potassium and magnesium, shows the possibility of using them as raw materials in various sectors of the national economy and meeting the demand for finished products. This will allow us to find solutions to the above problems [5-6].

In this article, the object of research was to study the chemical and mineralogical composition of salts in existing salt deposits on the border of Bukhara and Navoi regions and the possibilities of separating alkali metal salts based on them.

ISSN 3030-3907

Initially, several samples were taken to determine the composition of salt deposits formed around the Kuyimozar and Tudakul water basins. Their composition was studied using chemical analysis methods and modern SEM and IR spectra. It is known from the literature that the volume of the Kuyimozar water basin is 280-350 million tons of cubic meters of water, its area is 16.2-17.3 km2 [6-7] , and at present its area is significantly reduced, and the “Kagan fish farm” has been established around it, where many ponds and salt deposits have formed.

The composition of the obtained samples was analyzed for chemical elements using complexometric methods [8-11] , the results obtained are presented in Table1.

Table 1

the foundry reservoir and the composition of the formed salts

No.	Naming of parameters	Calibration	1 -sample (water)	Sample 2 (salt)
1.	Hydrogen indicator	pH	7.1	6.9
2.	Density	g /s m ^{3}	1,340	1,420
3.	Calcium	mg / dm^3	25.08	40.08
4.	Magnesium	mg / dm^3	1155.2	1155.2
5.	Iron	mg / dm^3	1.12	1.49
6.	Chlorides	mg / dm^3	16212.1	17378.1
7.	Nitrites	mg / dm^3	0.05	0.06
8.	Nitrates	mg / dm^3	0.2	0.4
9.	Sulfates	mg / dm^3	8350.0	9690.0
10.	Manganese	mg / dm^3	0.09	0.11
11.	Lead	mg / dm^3	0.10	0.14
12.	Copper	mg / dm^3	0.04	0.05
13.	Chrome	mg / dm^3	0.02	0.05
14.	Nickel	mg / dm^3	0.02	0.05
15.	Cobalt	mg / dm^3	0.58	0.75
16.	Carbonates	mg / dm^3	5.2	8.0
17.	Hydrocarbons	mg / dm^3	58.2	73.2
18.	Potassium	mg / dm^3	21.78	28.78
19.	Sodium	mg / dm^3	11520	12330

ISSN 3030-3907

Table 1 presents the results of complexometric methods for the chemical composition of water and salts of the Kuyimozar reservoir, including the amount of metals and anions, hydrogen indicator pH, and density. It was determined that the hydrogen indicator of liquid and solid salts corresponds to pH=6.8-7.1, the density is 1.340-1.420 g/m ^{3} , the largest amount of sodium is 12330.3; magnesium is 1155.2; potassium is 28.78; and many other metals are found in it, and in addition, from anions, chlorides are 16212.1 ; sulfates are 9690.0; hydrocarbonates are 73.2; in large quantities. In addition, chemical analysis revealed it is possible to see that carbonates have been formed in a small amount, which indicates that the existing salts may be in the form of sodium, potassium chloride, and magnesium sulfate.

The composition of these samples of water and salts was chemically analyzed using a modern Energodispersion X-ray fluorescence spectrometer, Rigaku NEX-DE . We can see that the largest amounts of sodium, chlorine and magnesium are present in them, which indicates that the composition is mainly sodium chloride and magnesium sulfate, and a smaller amount of potassium chloride and calcium sulfates. The results obtained are presented in Figure 1 .

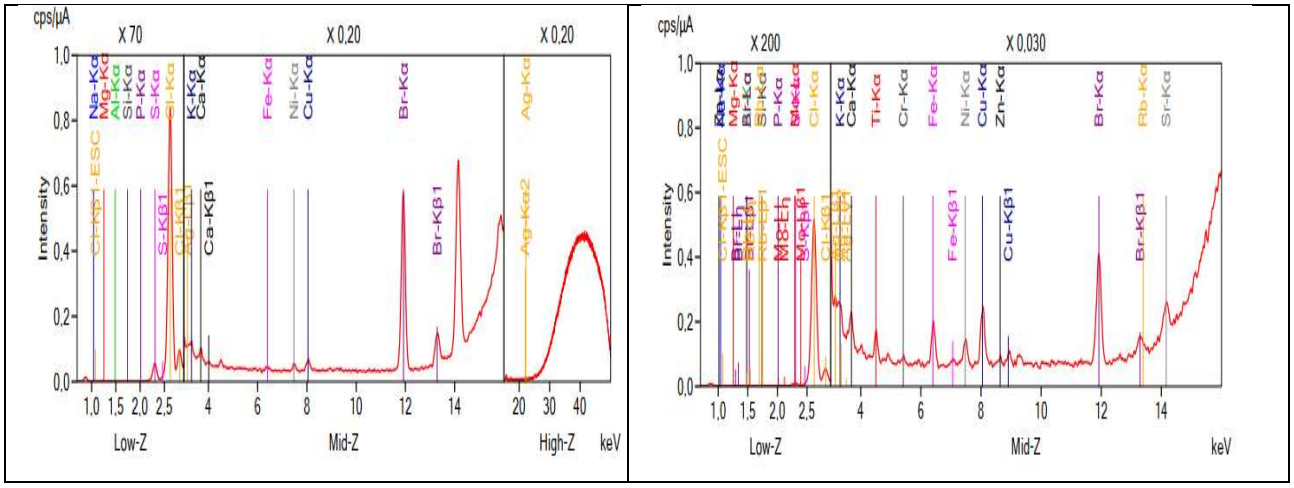


Figure 1. Results of devotogram analysis of water and salt content obtained around Quymozor reservoir

IK spectrum were taken to study the water and salt content in the vicinity of Kuyomizor reservoir , the obtained results are shown in Figure 2.

ISSN 3030-3907

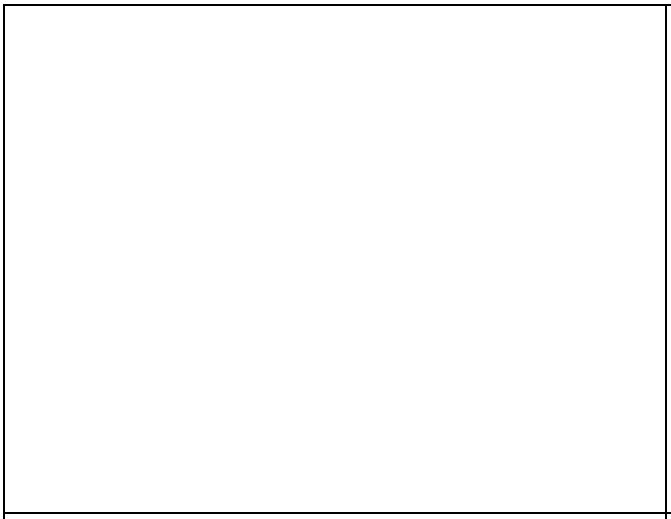
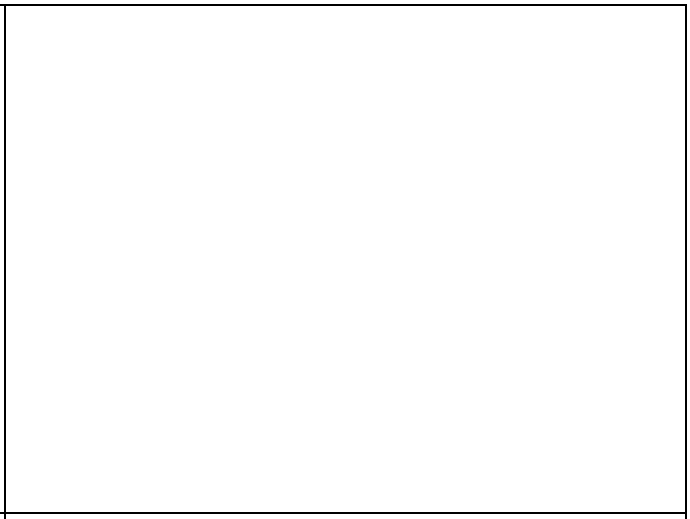
	
salt	water

Figure 2. IK -spectrum of water and salt content obtained around Quyimozor reservoir

the obtained IR spectra, it is possible to see the occurrence of metal bonds of magnesium and sodium with oxygen, and of chlorine and sulfate , which indicates that the metals in the compounds are bound to chlorine and sulfate.

In addition, SEM analysis of water and salt samples of Kuyimozor reservoir was also taken. We know that this analysis sheds light on the internal state of the substances being detected and shows how many elements are present. Based on this, SEM was analyzed in order to see the pictures and contents of the internal state of water and salt, and the results of the analysis were 3,4 - given in the pictures.

ISSN 3030-3907

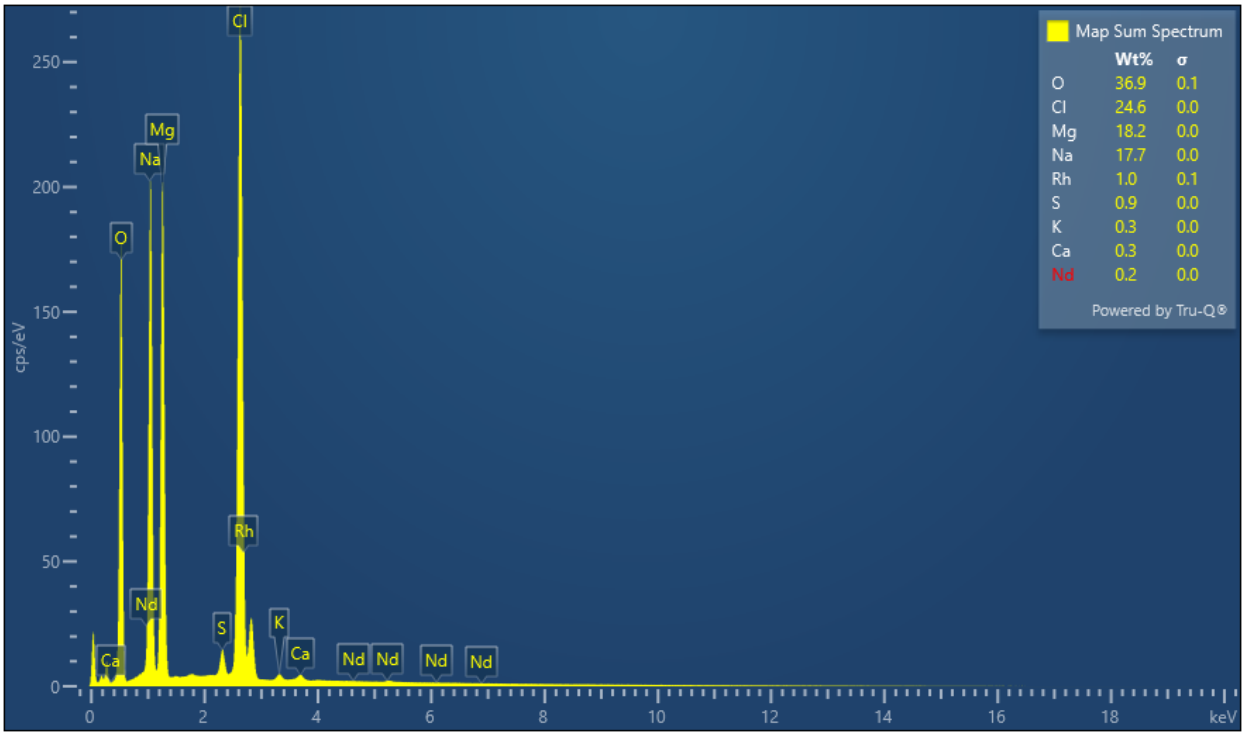


Figure 3. SEM analysis of the composition of water and salts obtained around the Quyimozor reservoir

In the SEM analysis, we can see that the salt contains sodium - 17.7; magnesium - 18.2; chlorine –24.6; and oxygen is 36.9%, which indicates that these samples are rich in sodium and magnesium, i.e. sodium chloride and magnesium chloride. The obtained microscopic pictures (Figure 4) also show that this salt is rich in sodium and magnesium.

ISSN 3030-3907

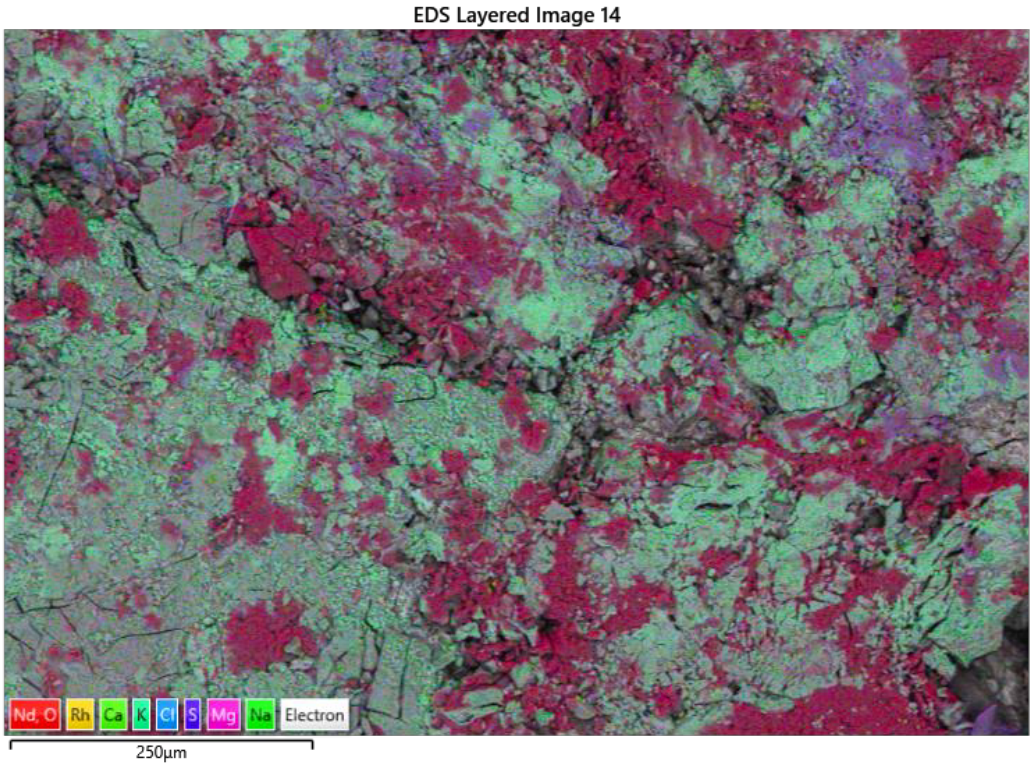


Figure 4. Microscopic view of a sample taken around the foundry reservoir

Conclusion The results of the study of water and salt samples taken around the Kuyimazar reservoir show that this water and salt are rich in many chemical elements, especially sodium and magnesium, which indicate its potential for use in various sectors of the national economy. Currently, the technology for obtaining finished products for the chemical industry based on the separation of sodium and magnesium salts is being studied.

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ISSN 3030-3907