

## POLLUTION CHARACTERISTICS OF SANGZOR RIVER WATER

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**Abstract:** The physicochemical properties of water and the amount of certain ions in it, the hardness and mineralization of river water at the start and end points of the Sangzor river in the Jizzakh region were determined on the basis of modern physicochemical methods. Also, on the basis of analysis, a scientific basis was given for the chemical change of ions.

**Keywords:** Pollution, mineralization, ionization, river flow, water hardness, household waste, permissible amount.

It is known that in the Jizzakh region, the Sangzor River, which amazes many with its flow in the opposite direction, begins near the Gurlash pass on the Turkestan mountain range at Springs with an altitude of about 3400 m and flows into Lake Tuzkon, located 70 km north of the city of Jizzakh. The southeastern edge of the Kyzylkum Desert. The length is 198 km, the area of its basin is 3220 km<sup>2</sup> [1].

Literature analysis has shown that pollution of Sangzor river water will depend on the direction of river flow, undergo chemical changes from top to bottom, but it is important to study how the characteristic features of its qualitative change are manifested. Therefore, this article is devoted to chemical changes in the water of the Sangzor river. The physicochemical properties of the river water at the upper and end points and the amount of  $\text{NH}_4^+$ ,  $\text{NO}_2^-$ ,  $\text{NO}_3^-$  and  $\text{SO}_4^{2-}$  ions in its composition, the hardness and mineralization of water are determined on the basis of modern physicochemical methods.

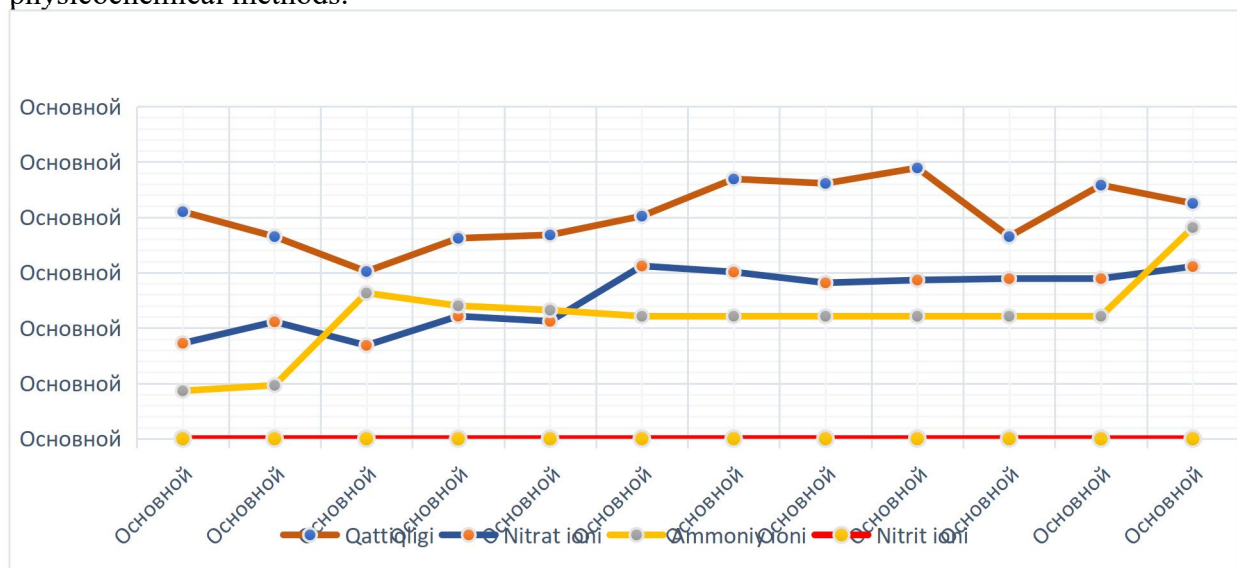
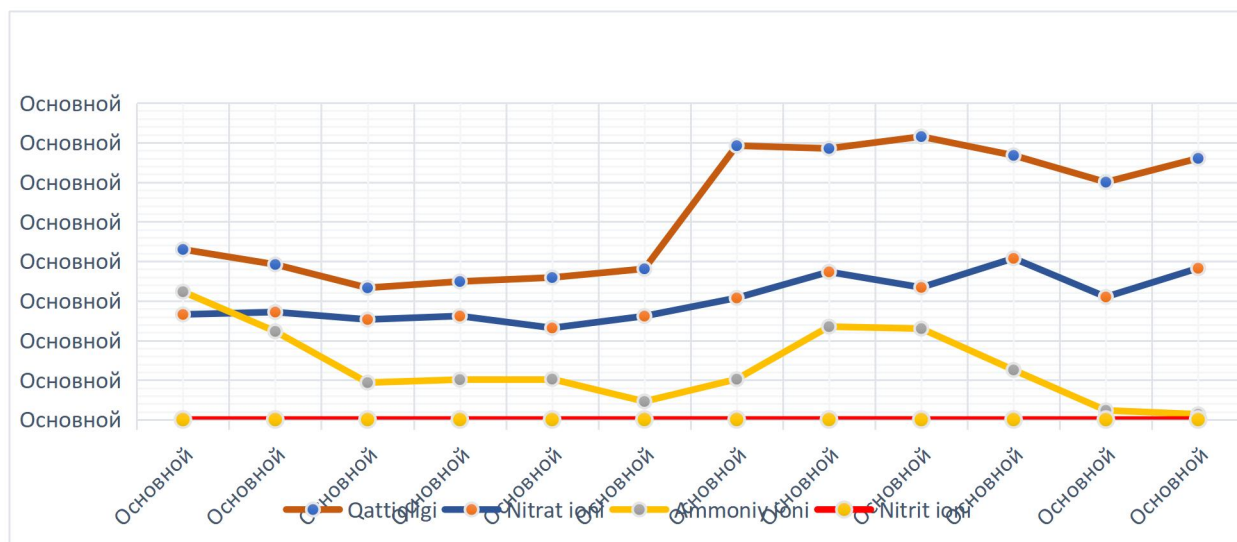


Figure 1. Dynamics of change of ions in the water of the Sangzor river by year.

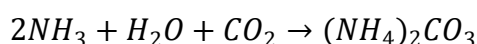


**Figure 2. Dynamics of change of ions in the water of the Sangzor river by year.**

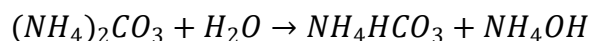
As can be seen from these pictures, the quality of the water of the Sangzor River is changing from year to year. The amount of nitrate ion in water was 3.120 mg/l in 1995 years and increased to 4.075 mg / l in 2020 years. Ammonium ions show much lower rates compared to previous analyses. The reduction of ammonium in water is due to its mixing with household waste, industrial waste and manure and the frequent appearance of nitrogen bacteria, which are used as a source of nutrients in water.

When comparing Sangzor river water by year, we can observe that the amount of nitrate, nitrite and ammonium ions is higher than the indicated concentration (PDK). The reason for the appearance of such pollution is the appearance of organic matter due to the rotting of plants along the banks of the river.

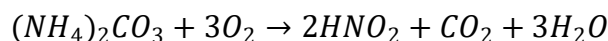
The annual increase in the concentration of nitrite ions in water depends on the ammonium ions in the water. Because the vapors contained in ammonium, carbon dioxide and water form ammonium carbonate crystals:



The resulting ammonium carbonate is easily hydrolyzed to form ammonium bicarbonate and ammonium hydroxide.



$NH_4HCO_3$  and  $NH_4OH$  in water cause the solution to exhibit buffer properties. The pH of the water remains equal to = 8.0-8.5. The fact that water has an alkaline environment  $(NH_4)_2CO_3$  is oxidized in the presence of oxygen, leading to the formation of acid.



It is known that natural waters contain magnesium and calcium chlorides, sulfates, hydrocarbons and other additives [2]. The presence of calcium and magnesium salts in the waters of the Sangzor River also causes water hardness. Figure 1 shows that in 1998, water hardness was 4.89

mg/ekv/l, hardness was 7.15 mg/ekv/l as of 2019. The river water has mostly constant rigidity, as the Sangzor River begins at Gurling pass in the Turkestan mountain range, the water composition is formed depending on the mineralogical structure of the mountain.

Changes in sulfate ions in river water are more clearly shown. The results of the analysis from the start and end points of the Sangzor river are shown in Figure

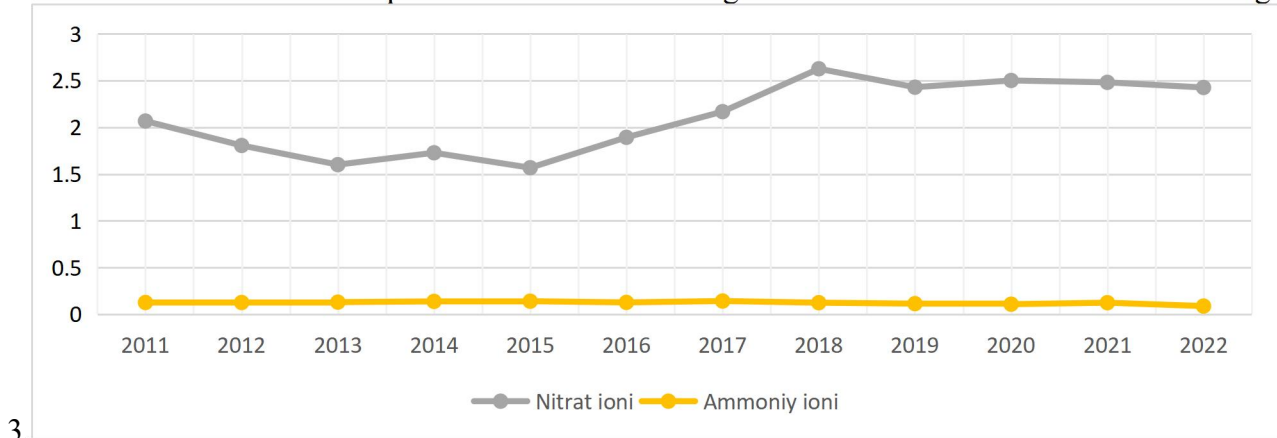
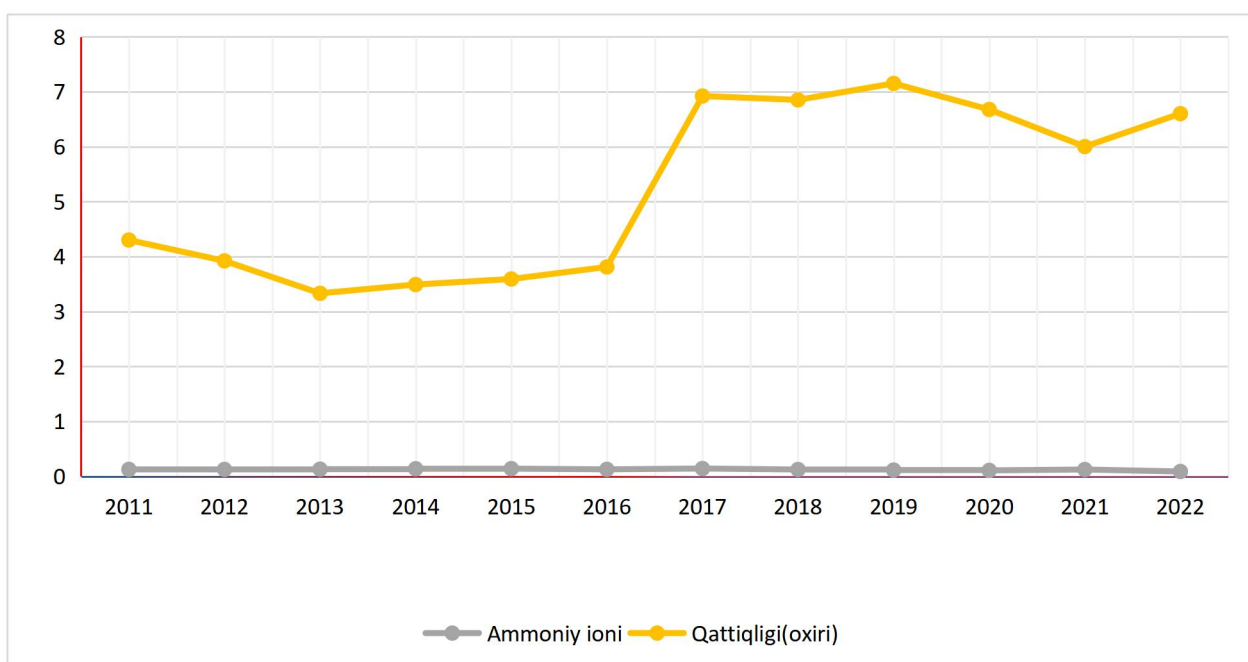


Figure 3. Dynamics of change of sulfate ion by year in Sangzor river water.

As can be seen from Figure 3, we can observe that at the starting and end points of the Sangzor river water, the amount of sulfate ion is much higher than that of PDK. Especially at the lower points of the Sangzor river, the concentration of the sulfate ion has high indicators. This can be shown as the effect of anthropogenic pollution generated by human activity around the Sangzor river.



#### Figure 4. Dynamics of change in the mineralization of the Sangzor river water by year.

In addition, we can observe the above condition when the mineralization of the Sangzor river water is also analyzed.

Figure 4 shows that the mineralization of water at the starting point of Sangzor river water was 257.3 mg/l in 2011, while at the end point of Sangzor River its mineralization peak was 284.25 mg/l in 2022. One of the main reasons for this is the increased concentration of most ions under the influence of waste thrown into the Sangzor river.

Thus, the level of pollution of the Sangzor river increases as it approaches the low plain as a result of anthropogenic exposure. This results in unstable substances that are insoluble in water and substances that are released into ions in an aqueous solution. In addition to the main ions in the water, it was observed that the amount of nitrate, nitrite and sulfate ions increases from year to year. Compared from 2001 to the present, it has been found that while some ions have increased from 1990 to 2022, some have decreased.

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