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INVESTIGATION OF CHEMICAL COMPOSITION OF THE ARAL SEA WATER IN AUTUMN SEASONS OF 2012AND 2013

Abstract. The water level in the Aral Sea started drastically decreasing from the 1960s onward. The reduction in the volume and area of the sea has led to significant changes in the hydrological, chemical and natural biological structure of the water. Regular observations of the chemical composition of the Aral Sea stopped in the early 90s. There were practically no observations of biogenic elements and the oxygen regime of water (the so-called "first day" analyses).

In September 2012 and October 2013, a complex of hydrochemical observations, including the measurement of the content of biogenic elements, dissolved oxygen, the concentration of hydrogen sulfide and components of the carbonate equilibrium, was carried out within the framework of international expeditions. The determinations were carried out directly on the seashore in a temporary laboratory. The main purpose of the work was to determine the content of nutrients in the water of the Aral Sea and to develop methods for hydrochemical studies in conditions of increased salinity (mineralization) of water. In addition, samples were collected to determine the total mineralization of water and the content of dissolved and suspended forms of metals. It was shown that the small depth of the sea and the high intensity of the processes of vertical transport of substances allowed that seasonal changes in the chemical composition affected the entire vertical water. Deeper than 18-30 meters in water, there was hydrogen sulfide. The presence of anaerobic conditions in the deep part of the sea affected all hydrochemical parameters. Some research results are given in the article.

Key words: the Aral Sea, biogenic elements, oxygen.

Introduction. After a fairly long break, starting from 2002, the annual complex oceanographic studies of the Aral Sea was resumed by the Federal state budgetary institution of science of the IO RAS (Russia) and Khoja Akhmet Yassawi International Kazakh-Turkish University (Kazakhstan), together with the Institute of Geology and Geophysics named after Kh. M. Abdullaev (Academy of Sciences of Uzbekistan), Nukus State Pedagogical Institute named after Azhiniyaz (Uzbekistan) of Karakalpak State University named after Berdakh [1-3].

The study of the hydrochemical conditions of the reservoirs at such a stage of degradation as now the Aral Seapresents a unique opportunity for studying the catastrophic consequences of both anthropogenic impact and climate change. In this case, the Aral Sea can be considered as a unique natural laboratory as it does not sound cynical.

The correct determination of the content of biogenic elements practically excludes long-term transport of samples. The sooner the tests are performed, the more reliable the results are obtained. The permissible storage time for samples under different manuals is determined from 6 to 12 hours after the selection [3-5]. The conservation of samples naturally increases the risk of obtaining unreliable results. So, with the widespread procedure of sample freezing, it is possible to form a sparingly soluble precipitation or sorption of carbonates on the inner surface with a vial, which is especially manifested under conditions of increased mineralization. For this reason, analyses of the phosphate, nitrate, nitrite and ammonium nitrogen, as well as pH values are sometimes called "the first day analyzes". Therefore, in expeditions