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ABOUT RATIO AND VALUES OF THE EMPIRICAL COEFFICIENT OF ALKALI METALS (Na$^+$ and K$^+$) IN SURFACE WATERS OF KAZAKHSTAN ON THE EXAMPLE OF THE ILE RIVER

Abstract. Issues concerning to insufficient knowledge of such important aspects in the field of regional hydrochemistry, which are the patterns of formation of the regime and the dynamics of alkali metals (sodium and potassium) in surface waters are considered. It is pointed out the need for reliable analytical data on the separate concentration of sodium and potassium in natural waters to solve important practical problems in the field of assessing the suitability of the composition of the water of reservoirs for acclimatization of valuable forage organisms for fish, when choosing water sources for irrigated areas. Special attention is paid to the importance of the empirical coefficient (EC) of sodium and potassium, which is necessary in determining the total mineralization of natural waters, on which the level of their use for various household and drinking needs depends. On the state monitoring data, the nature of changes in the ratio of sodium and potassium along the Ile River was studied and the EC was established to calculate their absolute concentration (in mg/dm^3) and total water mineralization. Based on the analysis of literature data and the results of our own research on the item under consideration, conducted in different years for a number of reservoirs and watercourses in Kazakhstan, it was concluded that: previously adopted for the entire territory of the former USSR, the EC equal to 25 for freshwater reservoirs can be used for waters of some river basins of the Republic of Kazakhstan with their mineralization up to 350-400 mg/dm^3. A decisive role in the formation of the regime and the dynamics of the concentration of sodium and potassium in surface waters has a complex of regional physiographic conditions: climate, nature of the soil, groundwater, anthropogenic influences, etc. The necessity of establishing the EC for reservoirs and watercourses of different climatic zones of the Republic of Kazakhstan, especially for large transboundary basins, is recommended.

Key words: sodium and potassium, values of their ratio in surface waters, empirical coefficients of alkali metals.

Introduction. The sodium and the potassium are one of the main components of the chemical composition of natural waters. However, until now, due to the sufficient laboriousness of their separate chemical analysis and limited distribution of sensitive and relatively simple methods for determining these ions, they are often not determined separately, and the total content of Na$^+$ and K$^+$ is calculated from the difference between the sum of anions and cations. The data obtained in this case cannot be considered reliable, since the calculated value of the sum of Na$^+$ and K$^+$ contains errors of chemical determination of all major ions.

In terms of assessing the genetic conditions for the formation of the chemical composition of waters of different types of reservoirs, as well as to develop a number of methodological approaches in their study, it is very important to know about the content of water and migration characteristics of alkali metals – Na$^+$ and K$^+$. The study of the dynamics of Na$^+$, K$^+$ and their ratios is of great importance in determining