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THEORY AND PRACTICE OF SELFPURIFICATION CAPACITIES OF NATURAL WATER IN KAZAKHSTAN

Abstract. The theoretical basis and practical about self-purification and self-cleaningcapacity of natural water sourcesin arid areas in Kazakhstan have been analyzed. It was foundout thatone of the unique properties of natural water is the self-purification capacity of water masses. Moreover, in the lakes and rivers of arid zones, those processes can be intensified because of the shallowness and intensive mixing of water. Those processeslead to oxygen saturation, turbidity, emergence of colloidal suspended solids,and solarradiation heating.Also,the role of various factors for how vegetation residuesin the mineralization process evolved biogenic organic matters is analyzed. It was explicitlynoted that the processes of degradation and mineralization of the leavescould progress at different speeds for different trees. Most of the time, the river water was enriched with easily oxidized organic substances and ammonium nitrogen.

The experiment methods helped to identify the self-purification capacity of the river Ulken Almaty tested river area with its ecotopes. Thus, such research provides the opportunity to determine whether rivers or other waterbodies need additional measures to enhance the effectiveness of natural water processes or to neutralize the pollution coming from the outside.

Keywords: self-purification, self-cleaning capacity of natural waters, degradation of organic matter, water resources conservation.

Aims and background. The process of self-purification in contaminated natural water sources is associated with a variety of naturalprocesses (hydrodynamic, chemical, microbiological and hydro biological)which result in the restoration of the original properties and composition of water in water-bodies (lakes, rivers, reservoirs, etc.) [1]. A large number of pollutants and specific (physical and geographical) conditions of water bodiescan depend onthe complex variety of valuable natural self-cleaningcapacities of water in water bodies. Mainly, natural self-cleaningspeed and direction can bemeasured through water pollutants' chemical properties, content and combinations. At the same time, dilution and mixing of sewage with natural water in water reservoirs can cause hydro biological and hydro chemical changes or substance transformation process, which in their turn identifyself-cleaning speed and directions. The latter plays a decisive role in self-cleaning processasphysical and chemical reactionsare closely related to biological or microbiological processes; however, it is unclear and sometimes difficult to acknowledge which flow is predominant[2].

The study of self-purification capacity (SC) of water bodies can be conducted differently: through design analysis (calculation of water pollutants' modification rates, their maximum permissible discharge, modeling, prediction) and full-scale research (laboratory experiments directly in the water body). The most rigorous data can be obtained using the second design if aquatic contamination and self-cleaning of waterprocesses inreservoirs are immediatelyexamined. SC research can be preferably started with collecting and analyzingexistingdata and reconnaissance surveys of the water body in order to clarify the characteristics and the sources of pollution.