PROSPECTS FOR USING CERAMIC MINERALIZERS FOR PREPARATION OF DRINKING WATER

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Today, in the context of a constantly growing technogenic load on the environment, an increase in the world's population and the irrational use of natural resources, providing the population with high-quality drinking water is one of the priority areas of policy in all countries. According to experts, the total reserves of fresh water that can be used for drinking make up only 3% of the total volume of the Earth's hydro resources [1], which is only 35 million m3. Along with limited supplies of natural drinking water, it is increasingly used in industry, agriculture and housing and communal services, which are its largest consumers.

Most private houses use their own artesian boreholes, and apartment buildings use centralized water supply. In the first case, depending on the region, the water may have an increased concentration of salts or heavy metals, contain oil products, organic or inorganic pollution, in some cases - bacteria or viruses, and in the second case - an excess of chlorine compounds, an increased concentration of iron ions and other metals.

Particular attention should be paid to the mineral composition of drinking water, which is one of the main indicators of its quality. It not only determines its organoleptic characteristics, but is also one of the determining factors in the formation of public health. Long-term use of drinking water, which has an imbalance of the main biologically important mineral components, can cause specific human diseases - microelementosis, that is, diseases (symptoms) caused by deficiency or imbalance of microelements in the human body [2].

Since 2015, the national standard of Ukraine “Drinking water. Requirements and methods of quality control” [3], which expands the range of indicators of drinking water quality to 82 indicators in 10 groups. The introduction of this document will make it possible to implement the priority directions of the state policy to provide the population with high-quality and safe drinking water from centralized and non-centralized water supply.

But given the complexity and phased introduction of this standard, today, there is still a need for additional purification of drinking water supplied to consumers in private and apartment buildings. The most widely used for these purposes are portable and stationary household filtration systems, which include: tabletop jugs with replaceable cartridges, tap attachments, flow-through installations and reverse osmosis systems. The most effective of these systems are systems based on reverse osmosis, which effectively purify water from organic and inorganic pollutants, but after purification, the amount of minerals in its composition is insufficient. To ensure the required mineral composition of water in such systems, separate blocks are used − "mineralizers". However, most of the existing mineralizers are characterized by a rather short period of their use and a rapid decrease in the concentration of mineralizing components with an increase in the period of use. Therefore, an

urgent task is the development of ceramic mineralizers for drinking water purification systems with prolonged action.

The purpose of the work is to identify promising directions for the development of composite ceramic materials as mineralizers in systems for household purification and preparation of drinking water.

In the majority of existing mineralizers, a mixture of the corresponding water-soluble salts is used as an active agent. When using such mixtures, an excess of minerals will be observed in the water in the first weeks of use, which will sharply decrease over time. Mineralizers based on a mixture of natural minerals are more effective, but they are less common in use, and the level of their leaching due to the inhomogeneous composition of minerals can vary significantly. Therefore, to ensure the prolonged action of mineralizers, with a constant level of leaching of components, it is promising to create composite materials.

One of the options for creating such materials is the development of a composite based on bioinert ceramic material and natural minerals. By creating a hierarchical porous structure of the composite, a uniform level of leaching of the composite can be ensured and its prolonged action can be ensured. The necessary indicators of the mineral content of water can be provided by changing the type of minerals and their relationship with the ceramic matrix.

It is the development of composite mineralizers based on bioinert ceramic materials and natural minerals that will be the focus of our further work.

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