RESEARCH OF WATER QUALITY CONTROL PROCESS SENSORS

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Abstract
As is known, the provision of clean and high-quality water throughout the world is one of the global problems. Limitations on the supply of fresh water are associated with their pollution. The greatest threat is wastewater (industrial, agricultural and domestic wastewater). In a market economy, improving water use, increasing its efficiency, creating an economic mechanism for its use are urgent problems. Improving water use is not only of economic but also ecological importance.

Keywords: Biotest, living organism, water purification methods, classification, research

Introduction

The process of determining the toxic environment in water is called biotesting, and it is carried out using living organisms. The test object is a living organism that reports on the danger of the environment in which it lives, the amount of water it is poisoned with, and how it affects its vital functions. In biotesting of the aquatic environment, aquatic plants, such as duckweed or water, and animals: crustaceans, worms, fish, are used.

In experiments with crustaceans, Daphnia magna (Daphnia magna, females up to 6 mm) is most often used. Daphnia are wonderful crustacean plankton that have the ability to purify water by removing microscopic algae and bacteria from water bodies.

There are mainly four methods used to treat wastewater:

✓ Mechanical method:Special devices trap oil, grease, petroleum, and other contaminants on the surface of the water through heavy particles added to the water.

✓ Chemical method:through various reagents, the reagents react with some compounds while neutralizing others.

✓ Biological method:Most domestic wastewater and some industrial wastewater are treated biologically through biochemical and microbiological processes.

✓ Electrolysis method: By passing an electric current through contaminated water, the electric current absorbs harmful organic matter in the water, while separating metals, acids, and other inorganic matter from the water.

Methods for determining the level of water pollution can be classified as follows (Figure 1):

From an ecological point of view, laboratory tests are mainly carried out to check the quality of drinking water, industrial water and industrial water. Chemical, electrical conductivity and electrochemical methods are widely used in these processes. These methods have high accuracy.

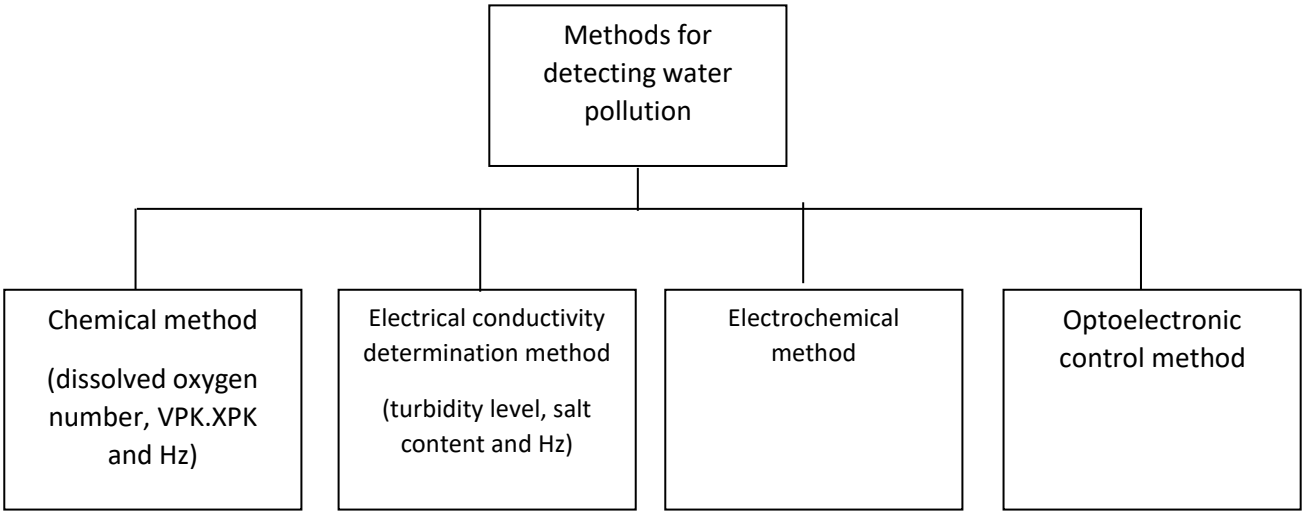

Figure 1. Methods for determining water pollutionclassificationI

However, since these methods are carried out by sampling, they cannot provide "fast" control at the "necessary" time. Also, since the measurement is performed for a certain volume of sample water, we cannot say that these methods are an integral solution for the total volume of water used. At the same time, these methods make it difficult to perform continuous express automatic control of constant flow waters.

From this point of view, the optoelectronic method shows its advantages here. We will consider this issue, namely the determination of the level of water pollution by the optoelectronic method, in more detail in the next chapter.

For general fluid controlTechnical instruments are divided into the following: automatic and laboratory analyzers. Analyzers are used to control the contamination and physical and chemical properties of liquids (waters). In general, control devices can be classified as follows:

- Drinking water control devices,
- Household water control devices,
- Fishagricultural waterscontrol devices,
- Natural (ground, surface, marine) water source control devices, wastewater control devices

The tools are mainly divided into the following groups:

– Water concentration measuring instruments;

– Instruments for monitoring the physical and chemical parameters of water;

– Instruments for monitoring general water parameters.

There are also analyzers that detect the presence of oil products in the water surface. An example is the FLYKOMAT analyzer developed by the Monitek company. The measurement system is based on the principle of reflection of ultraviolet pulse signals from the water surface.

The leading manufacturer of PE-type water samplers for ecological research is Ekros JSC (St. Petersburg) in Russia. PE series samplers are designed for sampling from natural and wastewater reservoirs for testing. Sampling is most often carried out using a bathometer-type device. The metal

product of NPP "Ekotekhnics" is especially popular, which can also provide sampling from deep water reservoirs.

Small-sized conductivity meters of the "EKA-2M" type have also found wide application in determining the salt content in water. Conductometers of the "EKA-2M" type, intended for laboratory use, have the best performance, allowing to determine the salt content in the water in a quick 5 s, measuring in the range from 0.05 to 1000 μSm / cm. Also, EX-type devices have found wide application in environmental monitoring. XPK-meter analyzers ("LEK-Standart") have recently been supplemented with new microprocessor meters "Ekotest-120-XPK" (NPP "Ekoniks"), which significantly reduced the detection process to 5-10 min.

Automation, instruments, sensors, and other technological control tools form the basis for the information and measurement system of water treatment plants and the automation of natural water purification.

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