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The Importance of Domestic Drinking Water Quality Testing

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Abstract: Along with the continuous development of social and economic development, in its development process, the economic development, but also caused a certain degree of pollution, seriously affecting the quality of drinking water, and directly harming people's health. It can be seen that the quality of drinking water quality is very important to ensure the quality of water, water quality needs to be effectively detected, the use of reasonable detection means, etc., according to the relevant requirements, to carry out the detection of drinking water quality, the detection process for strict control, to ensure that the detection results, so as to ensure that the quality of drinking water to meet the requirements, will not bring harm to human health.

Keywords:drinking water; water quality testing; importance

Water is to maintain human life and indispensable things, is the people's life necessities. In recent years, society and the public on the health of drinking water are increasingly important, and the quality of drinking water is extremely revered. The level of quality of drinking water directly affects the health of the people, Testing their physical and chemical indicators, to ensure the quality of drinking water and the level of safety, and the protection of people's health has a very important role. In today's economic development, people's living standards continue to improve, drinking water quality testing has become a key task of the relevant state departments, and water quality indicators are becoming increasingly fine, so far more than 100 pieces, for the safety of drinking water to lay the theoretical basis.

1. The importance of drinking water quality testing

Drinking water is different from domestic water,after drinking, directly absorbed by the body, so if there are corresponding quality problems in drinking water, then it will make the human body function in a way that has a negative impact. In the case of qualified or unqualified drinking water quality, the relevant testing work is carried out, which needs to go through the relevant physical, chemical, microbiological, etc., heavy metals and a number of other indicators to effectively test the overall water quality. Although some harmful substances in drinking water can be eliminated by high-temperature boiling, for some heavy metal content exceeds the standard water quality, the high-temperature boiling method can not improve the water quality to a certain extent. Directly after drinking has a certain effect on human cells, causing cell necrosis or changes in cell traits, which has led to some more serious diseases. Domestic water such as untreated, is convenient to drink, will lead to the human body organs such as the kidney corresponding lesions, and the occurrence of lesions may exist in a certain latent period, and then make people drinking water safety indifference phenomenon. This shows that drinking water quality has been effectively detected, whether for the development of society or for the health of the people themselves has a very

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important practical significance (Zhou & Zou, 2022)(Liu et al., 2022).

2. Problems in the detection of drinking water quality

2.1 Lack of senior testing personnel

Domestic water quality testing centre staffing is relatively unreasonable, and there is a general lack of testing personnel, and low education, especially in third-tier cities and villages and towns areas are most prominent. Testing personnel less water quality testing centres, etc., to meet the needs of conventional water quality testing, after the occurrence of unexpected pollution events, it is difficult to withstand the high intensity, the need for multiple data, fast, accurate testing needs; testing personnel technical level is limited by the water quality testing centre, non-professional graduates or low education of the testing personnel occupy a large proportion, this part of the people do not have a precise grasp of precision instrument use, no advanced Detection technology, resulting in inefficient detection, poor detection accuracy, etc. (Meng & Li, 2021).

2.2 Supervision and management system is not sound

Domestic water quality testing center at all levels of responsibility is not clear, the supervision and management system is disorderly, departmental ownership and the corresponding division of responsibility for the lack of legal system; some water quality testing center on the water supply department has a subordinate relationship, or and urban public sector water quality testing center has an interest in the lack of independence, not in line with the "Product Quality Law" on "product quality inspection, certification Social intermediaries must be set up in accordance with the law, and administrative organs and other state organs there are subordinate relations or other relations of interest" requirements, the occurrence of water quality does not meet the standards or water pollution incidents, due to the existence of subordinate relations or interests, may cause inaccurate water quality data, the report is not timely, information monopoly serious, etc., the safety of water supply constitutes Direct harm.

2.3 testing sampling points set unscientific

Drinking water quality testing sampling points are set up, mainly to the water source to the user of each water-related link to monitor water quality changes, to the water supply plant to ensure the safety of water production provides a basis for the sampling point arrangement to meet the representative and uniformity, convenient collection and other principles usually should be set at the water source intake, the factory water, secondary water supply points, the end of the pipe network water, units of their own water, rural centralized water supply and well water places. But most towns and cities only pay attention to the water source point and factory water quality testing, ignore the secondary water supply and end of the pipe network water detection, even units of their own water, rural centralized water supply and well water basically do not set up regular testing sampling points.

2.4 Testing information disclosure and sharing system is not perfect

China's water quality testing centre information disclosure and sharing the lack of relevant legal provisions, the water quality of the water supply system, water source information reports and annual summary reports, can not be timely public; and the source to the faucet of each water-related links for analysis, testing projects lack of unified coding system and evaluation system, due to the lack of order between the various water quality testing centre information transfer, so that water quality testing information can not be timely public sharing. Produced by the phenomenon of water quality testing information backwards, is serious, and even causes blockage of information transmission channels, which will bring huge losses (Liu et al., 2023).

3. common methods of drinking water quality testing

3.1 volumetric method

The volumetric method is the titration method, which is based on the change in colour of the indicator to indicate the endpoint of the titration, and then visually measure the volume of the standard solution consumed, and calculate the results of the analysis. At present, it is commonly used as an automatic potentiometric titration method, in which the endpoint is automatically determined by the instrument by changing the potential. This method is used in the physical and chemical inspection of domestic water, mainly for testing the total hardness of drinking water, biochemical oxygen demand, chloride and iodide, ozone and other indicators that are relatively more widely used.

3.2 Weight method

Weight method is by weighing the mass of the substance, the determination of the measured material components of the method. This method needs to be used in combination with other methods, first, the components to be tested and drinking water samples are separated, transformed into some form of weighing, and then weighed, through the weighed mass, the calculation of the required test components. This method of physical and chemical inspection of domestic water, mainly for drinking water total dissolved solids, sulfate and oil detection.

3.3 Spectrophotometric method

The spectrophotometric method determines the absorption of a given wavelength or wavelength range of light by the component to be tested and analyzes the nature of the substance qualitatively and quantitatively by measuring this absorption. This method is more sensitive, simple, and fast and other advantages of the current physical and chemical testing of drinking water is the most used means of detection. In the spectrophotometer, when a variety of wavelengths of light continued to irradiate a concentration of sample solution, it is possible to obtain the intensity of absorption corresponding to different wavelengths. This method of physical and chemical testing of domestic water, mainly for drinking water anionic synthetic detergent, cyanide, nitrate nitrogen, phosphate, sulfide, etc., iodide and other materials, and for different substances, spectrophotometric methods vary, for example, anionic synthetic detergent is determined by methylene blue spectrophotometry (Duan & Ma, 2020).

3.4 Gas chromatography

Gas chromatography, also called chromatography, is a method that uses gas as the mobile phase for chromatographic separation and analysis. The vaporized sample enters the column from the carrier gas (mobile phase), and the final outflow time is different due to the difference in the molecular forces of the components within the stationary phase of the sample within the column, thus separating the components. This method allows quantitative (by peak height, area,) and qualitative (by the time of peak appearance and sequence indicated on the chromatogram) analysis of compounds. This method is characterized by high analytical efficiency, good sensitivity, good selectivity, rapid analysis, wide application and simple operation. This method is in the physical and chemical inspection of domestic water, mainly for the detection of organic compounds in drinking water.

3.5 Liquid chromatography method

Liquid chromatography is based on the principle of liquid as the mobile phase, according to the different affinity of various components in the mixture in the two phases. The upper surface of a glass column containing carbon fixative is added to the extraction solution, and then a special compound is drizzled on the column, as a result of which different pigments are separated into the column, forming a spectrum of different colour bands, each of which represents a different pigment. The application of this method requires qualitative control with known standards, and the results cannot be obtained directly from the chromatogram. In the physical and chemical testing of domestic water, this method is mainly used for the detection of volatile and semi-volatile organic compounds in drinking water, such as methomyl, microcystins, etc. Glyphosate and other indicators.

3.6 Ion chromatography

The ion chromatography method is a special high-performance liquid chromatography, this method uses the principle of ion exchange, continuous separation of drinking water samples coexisting with a variety of anions or cations, and qualitative and quantitative analysis combined with other means. In the cation analysis, the separation column is filled with a low-capacity cation exchange resin, with the hydrochloric acid solution as the eluent. Compared to the chemical analysis method, the instrumental analysis method, this method is characterized by the advantages of easy operation, high speed, high accuracy, good sensitivity and specificity. This method of physical and chemical inspection of domestic water is mainly for the detection of various anions, chloride, fluoride, etc., sulfate and other indicators in drinking water.

3.7 Atomic absorption method

The atomic absorption method belongs to the more special spectrophotometric method, mainly on the specimen in the atomic state of the existence of metal elements and some non-metallic elements to study. It uses the principle that the characteristic spectral line emitted by the lamp of the element to be measured passes through the atomic vapour generated by the atomization of the test article, and adsorbs the elemental ground state atoms of the element to be measured in the vapour, and finds out the content of the element to be measured in the test article by measuring the attenuation degree of the radiation light intensity. This method of physical and chemical testing of domestic water is mainly for the detection of zinc, iron, manganese, and copper in drinking water (Zhou & Hou, 2020).

4. Sound living drinking water quality testing system construction of effective measures

4.1 Optimize the configuration of water quality testing institutions

In the town, the daily demand for drinking water is very large, if only the water quality testing after the factory, it is easy to cause pollution in transport. Therefore, the relevant departments need to take into account the demand for drinking water points and water source types, using the principle of proximity, water quality testing institutions for regional optimization of the configuration, at the same time, for the nature of the water source, the reasonable organization of water quality testing institutions level, from the number of users and the degree of water pollution in two aspects of comprehensive consideration. Usually, the water quality testing agency level is also linked to the administrative division, so sub-regional distribution improves the level of water quality management.

4.2 Improve the overall level of water quality testing

In essence, the development of drinking water quality testing is mainly dependent on water quality testing technology, and the level of testing technology, which directly affects the accuracy of the test results, but also the drinking water quality assessment. Therefore, it is necessary to improve water quality testing technology. The relevant departments in water quality testing, need to actively introduce, drawing on advanced foreign technology and experience, optimize and improve China's water quality testing technology, the choice of more scientific, more effective, more accurate water quality testing technology. For example, for pollutants, minerals and other tests, you can use a higher level of liquid chromatography/mass spectrometry technology.

4.3 Give full play to the role of water quality testing equipment

Carry out water quality testing, in addition to science and technology, the key is to use good equipment. In the new period, the relevant departments need to take into account the level of water quality testing institutions, water pollution characteristics and other factors, equipped with relevant testing equipment, to provide sufficient financial support. The relevant departments should actively introduce advanced equipment from foreign countries for water quality testing, learn from people's advanced equipment production process, and based on this, strengthen independent research and development, research more efficient, high

precision, operable devices. In addition, for the region for water quality testing, it is necessary to establish a relevant database, which will be the classification of equipment, models, role and other tests, operating precautions, etc., but also for different areas of water quality testing results, etc., for a unified summary and organization, so that the agencies share resources(Zhang, 2020).

4.4 Improve the professionalism of testing personnel

The quality of testing personnel and the quality of drinking water quality testing will also have a certain impact on the relevant departments and water quality testing institutions need to focus on improving the overall quality of testing personnel, on the one hand, focus on improving the professional skills of water quality testing, through strengthening learning and training, out of the further study and other enrich the practical experience and theoretical knowledge, mastering the latest standards and technology for water quality testing, and enhance business skills. On the other hand, we should strengthen the sense of responsibility of the testing personnel, enhance the sense of responsibility for testing, moral sense, etc., and be able to seriously, seriously, factual work to ensure that the test results are true and reliable.

4.5 improve the public's correct knowledge of poor water quality

Sound living drinking water quality testing system, can not be without user assistance. Relevant departments and water quality testing agencies should focus on the public to carry out water quality testing publicity work, to inform the public of water quality testing. Popularize for the general public in daily life to distinguish whether the water quality is faulty tips, when the water quality problems, and find the relevant departments to solve, find the testing agency, testing water quality. In addition, it is also necessary to increase the degree of public cooperation in water quality testing to avoid damage to water quality testing equipment, especially some of the intelligent equipment currently being applied, people must be urged to give protection. In addition, the public is also guided to frequently clean their home water heaters and boiling kettles to remove limescale in a timely manner so as not to accumulate to a certain concentration and damage their health(Yang, 2019).

5. Conclusion

As we all know, people's lives are inseparable from water, once the safety of drinking water problems and direct damage to people's health to ensure the quality of drinking water, water quality testing of drinking water is very necessary, the use of reasonable detection methods for testing, testing of water quality, through the analysis of test results, access to water quality, an important sign to judge the quality of water is good or bad is the test results, so the water quality testing, must be strictly controlled The utility model makes the detection will not be interfered by various factors, thus ensuring that the detection results are accurate, and then ensure the safety of drinking water.

Conflict of Interest

The authors declare that they have no conflicts of interest to this work.

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