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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 8538-2022

**National food safety standard - Methods for examination of
natural mineral drinking water**

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foreword

This standard replaces GB 8538-2016 "National Food Safety Standard Drinking Natural Mineral Water Inspection Method".

Compared with GB 8538-2016, the main changes are as follows.

- Pseudomonas aeruginosa added the content of confirmation test;
- Added the methods and requirements for sampling and preservation of water samples for microbial testing in Appendix B;
- Coliform modified the multi-tube fermentation test method and its scope of application;

--- Clostridium perfringens modified confirmatory test and enumeration method and enumeration medium.

national food safety standards

Test method for drinking natural mineral water

1 Scope

This standard specifies the color, taste and odor, state, turbidity, pH, total dissolved solids, total hardness, total alkalinity of drinking natural mineral water

degree, total acidity, multi-element determination, potassium and sodium, calcium, magnesium, iron, manganese, copper, zinc, total chromium, lead, cadmium, total mercury, silver, strontium, lithium, barium, vanadium, antimony, cobalt, nickel,

Aluminum, Selenium, Arsenic, Borate, Metasilicic Acid, Fluoride, Chloride, Iodide, Carbon Dioxide, Nitrate, Nitrite, Carbonate and Bicarbonate, Sulfur

Acid salts, oxygen consumption, cyanide, volatile phenolic compounds, anionic synthetic detergents, mineral oil, bromate, sulfide, phosphate, total beta radioactivity, tritium, ^{226}Ra radioactivity, coliforms, Streptococcus faecalis, Pseudomonas aeruginosa, Clostridium perfringens determination method.

This standard applies to the determination of drinking natural mineral water indicators.

2.1 Principle

It is formulated with potassium chloroplatinate and cobalt chloride to make a standard color with the same hue as natural water yellow for visual colorimetric determination of water samples. Regulation

The color of 1mg/LPt [existing in the form of $(\text{PtCl}_6)^{2-}$] is used as a chromaticity unit, which is called 1 degree. Even slight turbidity can interfere with the measurement, so turbid water samples need to be centrifuged to make them clear.

2.2 Reagents and materials

Unless otherwise specified, the reagents used in this method are of analytical grade, and the water is grade 3 water specified in GB/T 6682.

2.2.2 Cobalt chloride ($\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$).

2.2.3 Platinum-cobalt standard solution. accurately weigh 1.246g potassium chloroplatinate (K_2PtCl_6) and 1.000g dry cobalt chloride ($\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$), dissolve in 100mL water, add 100mL hydrochloric acid ($\rho_{20} = 1.19\text{g/mL}$), dilute to 1000mL with water. The color of this standard solution is 500 degrees.

2.4.1 Sample processing

Pipette 50mL of transparent water sample into a colorimetric tube. If the color of the water sample is too high, take less water sample, add water to dilute the color, and multiply the result by

dilution factor.

2.4.2 Determination

Take another 11 colorimetric tubes, add platinum-cobalt standard solution (2.2.3) 0mL, 0.50mL, 1.00mL, 1.50mL, 2.00mL,

2.50mL, 3.00mL, 3.50mL, 4.00mL, 4.50mL and 5.00mL, add water to the mark, shake well, that is, the chromaticity is 0 degrees,

Standard series of 5 degrees, 10 degrees, 15 degrees, 20 degrees, 25 degrees, 30 degrees, 35 degrees, 40 degrees, 45 degrees and 50 degrees.

Compare the water sample with the platinum-cobalt standard color series, if the color tone of the water sample is inconsistent with the standard series, it is a different color, which can be described in words.

2.5 Presentation of analysis results

The chromaticity in the sample is calculated according to formula (1).

$$\text{Chroma} = V_1 \times 500 V(1)$$

In the formula. chromaticity---unit is degree;

V_1 --- equivalent to the amount of platinum-cobalt standard solution, in milliliters (mL);

V -volume of water sample, in milliliters (mL).

3.1 Taste analysis steps

Take a small amount of water sample and put it in your mouth (this water sample should be harmless to human body), do not swallow it, taste the taste of the water, describe and record it with appropriate words.

3.2 Odor analysis steps

Measure 100mL water sample, put it in a 250mL conical flask, after shaking, smell the smell of water from the bottle mouth, describe and record with appropriate words.

4 Status

Shake the water sample well, observe directly with the naked eye, and record.

5.1 Principle

The intensity of the scattered light from the standard suspension of formazin was compared with the intensity of the scattered light from the water sample under the same conditions.

The intensity of scattered light

The larger the value, the higher the turbidity.

5.2 Reagents and materials

Unless otherwise specified, the reagents used in this method are of analytical grade, and the water is grade 3 water specified in GB/T 6682.

5.2.1 Hydrazine sulfate solution (10g/L). Accurately weigh 1.000g of hydrazine sulfate $[(\text{NH}_2)_2\text{H}_2\text{SO}_4]$, dissolve in water, and dilute to a 100mL volumetric flask.

Warning---The solution is carcinogenic, avoid inhalation, ingestion and skin contact!

5.2.2 Hexamethylenetetramine solution (100g/L). accurately weigh 10.00g of hexamethylenetetramine $[(\text{CH}_2)_6\text{N}_4]$, dissolve in water, and dilute to

in a 100mL volumetric flask.

5.2.3 Formazin standard suspension. respectively pipette 5.00mL hydrazine sulfate solution and 5.00mL hexamethylenetetramine solution into a 100mL volumetric flask, mix well, and place at 25 degrees C $\pm$ 3 degrees C for 24h Then, add water to the mark and mix well. The turbidity of this standard suspension is 400 NTU. Book

Standard solution can be used for one month.

5.2.4 Formazin standard working solution. Dilute the formazin standard suspension 10 times with water. The turbidity after dilution is 40NTU, and it should be diluted appropriately when needed.

5.3 Instruments and equipment

Scattering Turbidimeter.

5.4 Analysis steps

Operate according to the instruction manual of the instrument. When the turbidity exceeds 40NTU, it can be diluted with water and measured.

5.5 Presentation of analysis results

The result is calculated by multiplying the turbidity reading displayed by the instrument by