GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB 13200-91

Water quality - Determination of turbidity

水质 浊度的测定

Approved on: August 31, 1991 **Implemented on: June 01, 1992**

Issued by: National Environmental Protection Agency

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Water quality - Determination of turbidity

This standard refers to and adopts the international standard ISO 7027-1984 "Water quality - Determination of turbidity".

1 Subject contents and scope of application

1.1 This standard specifies two methods for determining turbidity in water. The first part is the spectrophotometric method, which is applicable to drinking water, natural water, high-turbidity water; the minimum detection turbidity is 3 degrees. The second part is visual turbidimetry, which is applicable to low-turbidity water, such as drinking water and source water; the minimum detection turbidity is 1 degree.

1.2 There shall be no debris and easily sinking particles in the water. If the utensils used are not clean, OR there are dissolved bubbles and colored substances in the water, it will interfere with the measurement.

Part 1 -- Spectrophotometry

2 Principle

At an appropriate temperature, hydrazine sulfate and hexamethylenetetramine polymerize, to form a white polymer. It is used as a turbidity standard solution, to compare with the turbidity of the water sample, under certain conditions.

3 Reagents

Unless otherwise specified, it shall use the analytically pure reagents, deionized water or water of equivalent purity, which comply with national standard or professional standard, in the analysis.

3.1 Turbidity-free water

The distilled water is filtered through a 0.2 μm filter membrane; collected in a flask that was shaken-rinsed twice by filtered water.

3.2 Turbidity standard stock solution

3.2.1 The 1 g/100 mL hydrazine sulfate solution

Weigh 1.000 g of hydrazine sulfate [$(N_2H_4)H_2SO_4$]. Dissolve it in water. Make its volume reach 100 mL.

Note: Hydrazine sulfate is toxic and carcinogenic!

3.2.2 The 10 g/100 mL hexamethylenetetramine solution

Weigh 10.00 g of hexamethylenetetramine [$(CH_2)_6N_4$]. Dissolve it in water. Make its volume reach to 100 mL.

3.2.3 Turbidity standard stock solution

Pipette 5.00 mL of hydrazine sulfate solution (3.2.1) AND 5.00 mL of hexamethylene tetramine solution (3.2.2), put into a 100 mL volumetric flask. Mix it uniformly. Let stand at 25 ± 3 °C for reaction for 24 h. After cooling, use water to dilute it to the marking line. Mix it uniformly. The turbidity of this solution is 400 degrees. It can be stored for one month.

4 Instruments

General laboratory equipment and the following:

4.1 The 50 mL colorimetric tube with stopper.

4.2 Spectrophotometer.

5 Samples

The samples shall be collected in glass bottles with stoppers. It shall be tested as soon as possible after sampling. If it needs to be stored, it can be stored in a cool and dark place, for no more than 24 hours. Before testing, shake vigorously and make it return to room temperature.

All glassware in contact with the sample must be clean; it can be washed by hydrochloric acid or surfactants.

6 Analytical procedures

6.1 Drawing of standard curve

Pipette 0, 0.50, 1.25, 2.50, 5.00, 10.00, 12.50 mL of turbidity standard solution (3.2.3). Put it in a 50 mL colorimetric tube. Add water to the mark. After shaking uniformly, it obtains the standard series, which have the turbidity of 0.4, 10, 20, 40, 80, 100 degrees. At a wavelength of 680 nm, use a 30 mm cuvette to measure the absorbance. Draw a calibration curve.

9 Reagents

Unless otherwise specified, during analysis, it shall use the analytically pure reagents, deionized water or water of equivalent purity, which comply with national standard or professional standard, in the analysis.

9.1 Turbidity standard solution

9.1.1 Turbidity standard stock solution: Weigh 10 g of diatomaceous earth, which has passed through a 0.1 mm sieve, in a mortar. Add a little water to make a paste. Grind it. Transfer it to a 1000 mL graduated cylinder. Add water to the mark. After fully stirring, let it stand for 24 hours. Use the siphon method, to carefully transfer the upper layer 800 mL suspension, into a second 1000 mL graduated cylinder. Add water to 1000 mL. Stir well. Let it stand for 24 hours. Absorb the upper layer of 800 mL of the suspension, which contains finer particles. Discard it. Add water to the lower part of solution, to dilute it to 1000 mL. After fully stirring it, store it in a stoppered glass bottle, in which the diameter of diatomaceous earth particles is about 400 μm.

Take 50.0 mL of the above suspension. Place it in a constant-weight evaporating dish. Evaporate it to dryness on a water bath. Bake it in an oven at 105 °C for 2 hours. Place it in a dryer to cool for 30 min. Weigh it. Repeat the above operations, that is, bake for 1 hour, cool, weigh, until constant weight. Calculate the weight (mg) of diatomaceous earth, which is contained in 1 mL of the suspension.

9.1.2 Standard solution with turbidity of 250 degrees: Pipette a suspension, which contains 250 mg of diatomaceous earth. Place it in a 1000 mL volumetric flask. Add water to the mark. Shake it uniformly. The solution has a turbidity of 250 degrees.

9.1.3 Standard solution with turbidity of 100 degrees: Pipette 100 mL of standard solution (9.1.2), which has a turbidity of 250 degrees, in a 250 mL volumetric flask. Use water to dilute it to the mark. Shake it uniformly. The turbidity of this solution is 100 degrees.

Add mercury chloride to each standard solution, to prevent the growth of fungi.

Note: Mercury chloride is highly toxic!

10 Instruments

General laboratory equipment and the following:

10.1 The 100 mL colorimetric tube with stopper.

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