

ICS 13.060
CCS Z 16

HJ

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

HJ 537-2009

Replacing GB 7478-1987

**Water quality. Determination of ammonia nitrogen.
Distillation-neutralization titration**

水质 氨氮的测定 蒸馏-中和滴定法

(English Translation)

Issued on: December 31, 2009

Implemented on: April 1, 2010

Issued by: Ministry of Ecology and Environment

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Foreword

To protect the environment and protect the human body in order to implement the Environmental Protection Law of the People's Republic of China and the Law of the People's Republic of China on Water Pollution Prevention and Control to develop and standardize the monitoring methods for ammonia nitrogen in water.

This standard specifies the distillation-neutralization titration method for the determination of ammonia nitrogen in water.

This standard is a revision of the "Determination of Distillation and Titration of Ammonium Water" (GB 7478-87).

This standard was first published in 1987. The original standard drafting unit was the Jiangsu Provincial Environmental Monitoring Station. This is the first revision.

The main contents of this revision are as follows.

-- Revised the name of the standard, modified from "Determination of Water Ammonium by Distillation and Titration" to "Determination of Ammonia Nitrogen in Water Quality" - Neutralization titration.

- In the scope of application, the sensitivity is eliminated; the method detection limit is clarified.
- Added calibration method for hydrochloric acid standard solution.
- Modified the preparation method of the mixed indicator.
- A table of conversion factors for the mass concentration of various forms of nitrogen has been eliminated.
- Added quality assurance and quality control provisions.

As of the date of implementation of this standard, the former National Environmental Protection Agency approved and issued the "Distillation of Ammonium Water" approved by the National Environmental Protection Agency on March 14, 1987.

And the titration method (GB 7478-87) is abolished.

This standard was formulated by the Science and Technology Standards Department of the Ministry of Environmental Protection.

This standard is mainly drafted by. Shenyang Environmental Monitoring Center Station.

This standard was approved by the Ministry of Environmental Protection on December 31, 2009.

This standard has been implemented since April 1, 2010.

This standard is explained by the Ministry of Environmental Protection.

Water quality - Determination of ammonia nitrogen - Distillation - Neutralization titration

1 Scope of application

This standard specifies the distillation-neutralization titration method for the determination of ammonia nitrogen in water.

This standard applies to the determination of ammonia nitrogen in domestic sewage and industrial wastewater.

When the sample volume is 250 ml, the detection limit of the method is 0.05 mg/L (both in N).

2 Principle of the method

The pH of the water sample is adjusted to 6.0 to 7.4, and light magnesium oxide is added to make it slightly alkaline, and the ammonia released by distillation is absorbed by the boric acid solution. Take A Base red-methylene blue is an indicator, and the ammonia nitrogen (in N) in the distillate is titrated with a hydrochloric acid standard solution.

3 Interference and elimination

Substances that can be distilled under the conditions specified in this standard and which are capable of reacting with an acid interfere with the measurement. For example, urea, volatile amines and Chloramine in chlorinated samples, etc.

4 Reagents and materials

Unless otherwise stated, the reagents used in the analysis were analyzed analytical reagents in accordance with national standards, and the experimental water was prepared according to 4.1.

water.

4.1

No ammonia water, prepared in one of the following ways in an ammonia-free environment (see 10.1 for inspection without ammonia).

4.1.1 Ion exchange method

The distilled water was passed through a strong acid cation exchange resin (hydrogen type) column, and the effluent was collected in a glass bottle with a ground plug. Outflow per liter Add 10 g of the same resin to facilitate storage.

4.1.2 Distillation method

Add 0.1 ml of sulfuric acid (4.2) to 1 000 ml of distilled water, distill it in a full glass distiller, and discard the first 50 ml of distillate.

Approximately 800 ml of distillate was then collected in a glass vial with a ground plug. 10 g of strong acid cation exchange resin per liter of distillate (hydrogen type).

4.1.3 Water Purifier Method

Prepared directly using a commercially available water purifier.

4.2 Sulfuric acid, $\rho(\text{H}_2\text{SO}_4) = 1.84 \text{ g/ml}$.

4.3 Hydrochloric acid, $\rho = 1.19 \text{ g/ml}$.

4.4 absolute ethanol, $\rho = 0.79 \text{ g/ml}$.

4.5 Anhydrous sodium carbonate (Na_2CO_3), a reference reagent.

4.6 Light Magnesium Oxide (MgO), free of carbonates.

Heat at 500°C to remove the carbonate.

4.7 sodium hydroxide solution, $c(\text{NaOH}) = 1 \text{ mol/L}$.

Weigh 20 g of sodium hydroxide (NaOH) dissolved in about 200 ml of water, cool to room temperature, and dilute to 500 ml.

4.8 Sulfuric acid solution, $c(1/2\text{H}_2\text{SO}_4) = 1 \text{ mol/L}$.

Measure 2.8 ml of sulfuric acid (4.2) and slowly add 100 ml of water.

4.9 Boric acid (H_3BO_3) absorption solution, $\rho = 20 \text{ g/L}$.

Weigh 20 g of boric acid dissolved in water and dilute to 1 000 ml.

4.10 methyl red indicator solution, $\rho = 0.5 \text{ g/L}$.

Weigh 50 mg of methyl red in 100 ml of ethanol (4.4).

4.11 bromothymol blue indicator, $\rho = 1 \text{ g/L}$.

Weigh 0.10 g of bromothymol blue in 50 ml of water, add 20 ml of ethanol (4.4), and dilute to 100 ml with water.

4.12 Mixed indicator

Weigh 200 mg of methyl red in 100 ml of ethanol (4.4); otherwise weigh 100 mg of methylene blue in 100 ml of ethanol (4.4).

Take two portions of methyl red solution and one portion of methylene blue solution for use. This solution is stable for 1 month.

4.13 sodium carbonate standard solution, $c(1/2\text{Na}_2\text{CO}_3) = 0.020 0 \text{ mol/L}$.

Weigh anhydrous sodium carbonate (4.5) 0.530 0 g dried at 180°C for 2 h, dissolve in freshly boiled cold water, and transfer to 500 ml volumetric flask.

Medium, diluted to the mark.

4.14 Hydrochloric acid standard titration solution, $c(\text{HCl}) = 0.02 \text{ mol/L}$.

Measure 1.7 ml of hydrochloric acid (4.3) in a 1 000 ml volumetric flask and dilute to the mark with water.

Calibration method. Pipette 25.00 ml sodium carbonate standard solution (4.13) in a 150 ml Erlenmeyer flask, add 25 ml water, add 1 drop of methyl red the indicator liquid (4.10) was titrated to a reddish color with a hydrochloric acid standard solution (4.14). Record the volume consumed. Calculate hydrochloric acid solution using formula (1) Concentration of liquid (4.14).

$1(\text{HCl}) c V_c$

Where. c --hydrochloric acid standard titration solution (4.14) concentration, mol/L;