

HJ

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**Water quality - Determination of ammonia nitrogen - Salicylic
acid spectrophotometry
(English Translation)**

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Table of Contents

Foreword...	5
1 Application scope...	6
2 Method principle...	6
3 Interference and elimination...	6
4 Reagents and materials...	6
5 Instruments and equipment...	9
6 Sample...	9
7 Analytical procedures...	9
8 Results representation...	10
9 Accuracy and precision...	11
10 Quality assurance and quality control...	11
Appendix A...	13
Appendix B...	15

Foreword

In order to implement the Environmental Protection Act of the People's Republic of China and the Water Pollution Prevention Act of the People's Republic of China, protect the environment, guarantee human health and standardize the monitoring methods of ammonia nitrogen in water, hereby this standard is announced.

This standard specifies the determination of ammonia nitrogen in water by salicylic acid spectrophotometry.

This standard is revision to Water quality - Determination of ammonium- salicylic acid spectrophotometry (GB 7481-87).

This standard was initially published in 1987. And the original drafting organization was Jiangxi Province Ganzhou Environmental Monitor Station. This standard is revised for the first time. The main revised contents are as follows.

- The name of the standard is revised from Water quality - Determination of ammonium - Salicylic acid Spectrophotometry TO Water quality - Determination of

ammonium nitrogen - Salicylic acid spectrophotometry.

- Add the 30mm cuvette test method. Reduce the detection limits. Broaden the application range of the method. Clearly specify the lower and upper limits of the method.

- Combine the result calculation formulae.

- Modify the normative appendix.

The Water quality-Determination of ammonium-Salicylic acid Spectrophotometry (GB 7481-87) approved and released by the former State Environmental Protection Agency on March 14, 1987 shall be abolished, from the date of implementation of this standard.

Appendix A of this standard is normative. Appendix B is informative.

This standard was organized and formulated by Department of Science, Technology and Standards, Ministry of Environmental Protection of the People's Republic of China.

This standard was mainly drafted by. Municipal Environmental Monitoring Center Station of Shenyang.

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

This standard shall be implemented from April 1, 2010.

The Ministry of Environmental Protection is responsible for the interpretation of this standard.

Water quality-Determination of ammonia nitrogen-Salicylic acid spectrophotometry

1 Application scope

This standard specifies the salicylic acid spectrophotometry to determine ammonia nitrogen in water.

This standard applies to determination of ammonia nitrogen in groundwater, surface water, domestic sewage, and industrial wastewater.

When the sample volume is 8.0 ml and the 10 mm cuvette is used, the detection limit of this method is 0.01 mg/L, the determination lower limit is 0.04mg/L, and the determination

upper limit is 1.0 mg/L (all counted in N).

When the sample volume is 8.0 ml and the 30 mm cuvette is used, the detection limit of this method is 0.004 mg/L, the determination lower limit is 0.016 mg/L, and the determination upper limit is 0.25 mg/L (all counted in N).

2 Method principle

Under the condition that the alkaline medium (pH=11.7) and the sodium nitroprusside exist, chemical reactions happen AMONG the ammonia, ammonium ions AND the salicylate AND hypochlorite ions in water, to generate blue compound. Measure the absorbency with a spectrophotometer at 697 nm.

3 Interference and elimination

This method applies to the possible interfering substance and quantity limit during water sample analysis, see Appendix B for details.

Severe interferences generated by aniline and ethanol amine are rare. Usually the interference is generated by primary amine. When it contains chloramines, excessively high acidity, alkalinity, or when it contains substances that make hypochlorite ions reduction, the interferences may be generated.

If the color of the water sample is too dark, or the salt is excessive, or when the masking ability of the potassium tartrate to the metal ions in the water sample is insufficient, or when there is high concentration of calcium, magnesium and chloride in the water sample, pre-distillation is required.

4 Reagents and materials

Unless otherwise specified, the reagents used in analysis shall be analytical pure hydroxide solution (4.6), until the salicylic acid is fully dissolved. And use 1 mol/L of sulfuric acid to adjust PH of the solution to 6.0-6.5.

Appendix A

(Normative)

The preparation method of sodium hypochlorite solution and calibration of

effective chlorine concentration and free-base concentration

A.1 The preparation method of sodium hypochlorite solution

Put hydrochloric ($\rho=1.19\text{g/ml}$) acid, drop by drop, on the solid of potassium permanganate.

Guide the escaping chlorine into 2mol/L of sodium hydroxide absorption liquid for absorption, so as to generate the sodium hypochlorite solution in light grass green. Store in a plastic bottle. As this solution is not stable, the effective chlorine concentration shall be calibrated prior to use.

A.2 The measurement of effective chlorine in the sodium hypochlorite solution

Absorb 10.0ml of sodium hypochlorite (4.8) into 100ml volumetric flask. Add water to dilute to marked line. Mix well. Move 10.0ml of diluted sodium hypochlorite solution into 250ml iodine flask. Add 40ml of distilled water and 2.0g potassium iodide. Mix well. Add

5.0 mL of 6mol/L sulfuric acid solution. Mix well. Place in dark for 5min . Use 0.1mol/L of

sodium thiosulfate solution to titrate to light yellow. Add approximately 1ml of starch indicator. Continue to titrate it until the blue color disappears. Its mass concentration of effective chlorine shall be calculated as per Equation (A.1).

Effective chlorine (g/L , in Cl_2) =

Where.

c - Sodium thiosulphate solution concentration, mol/L ;

V - The volume of consumed sodium thiosulfate at titration, ml ;

35.45 - Molar mass of effective chlorine ($1/2\text{Cl}_2$), g/mol .

A.3 Determination of free-base (NaOH) in sodium hypochlorite solution

A.3.1 Calibration of hydrochloric acid

Sodium carbonate standard solution. $c(1/2\text{Na}_2\text{CO}_3)=0.1000\text{ mol/L}$. Weigh 2.6500g of anhydrous sodium carbonate that has been dried under 180°C for...

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