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

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**Water quality. Determination of ammonium nitrogen by flow
injection analysis (FIA) and Salicylic acid spectrophotometry**

水质 氨氮的测定 流动注射-水杨酸分光光度法

(English Translation)

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Table of Contents

Foreword

1 Scope of application

2 Normative references

3 Principle of the method

3.1 Working principle of flow injection analyzer

3.2 Principles of chemical reactions

4 Interference and elimination

4.3 When the pH of the sample is >12 or pH5 reagents and materials

5.11 Color developer. sodium salicylate solution

5.13 Ammonia nitrogen standard stock solution. $\rho(\text{N})=1000\text{mg/L}$

5.14 Ammonia nitrogen standard use solution. $\rho(\text{N})=50.0\text{mg/L}$

5.15 Sodium thiosulfate solution. $\rho=3500\text{mg/L}$

6 Instruments and equipment

7 Samples

7.1 Sample collection and preservation

8.1 Commissioning of the instrument

8.2 Calibration

8.3 Determination

8.4 Blank test

9 Calculation and representation of results

9.1 Calculation of results

9.2 Results representation

10 Precision and accuracy

10.1 Precision

10.2 Accuracy

11 Quality Assurance and Quality Control

11.1 Blank test

11.2 Calibration validity check

11.3 Precision Control

11.4 Accuracy Control

12 Precautions

Foreword

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 protect the environment, to ensure human health, standardize the determination method of ammonia nitrogen in water, and formulate this standard.

This standard specifies a flow injection-salicylic acid spectrophotometric method for the determination of ammonia nitrogen in water.

This standard is the first release.

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

This standard is mainly drafted by. Suzhou Environmental Monitoring Center Station and Changshu Environmental Monitoring Station.

This standard is verified by. Water Quality Testing Center of Suzhou Water Supply Company, Nantong Environmental Monitoring Center Station, Jiangsu Province Sea Ocean Fisheries Research Institute, Nanchang Environmental Monitoring Station, East China Normal University Hekou Coastal Science Research Institute and Changshu Environmental Monitoring Station.

This standard was approved by the Ministry of Environmental Protection on October 25, 2013.

This standard has been implemented since January 1, 2014.

This standard is explained by the Ministry of Environmental Protection.

Water quality - Determination of ammonia nitrogen - Flow injection - salicylic acid spectrophotometric method

1 Scope of application

This standard specifies the flow injection analysis-spectrophotometry for the determination of ammonia nitrogen in water.

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

When the detection optical path is 10mm, the detection limit of this method is 0.01mg/L (in N), and the measurement range is 0.04mg/L~5.00mg/L.

2 Normative references

The contents of this standard refer to the terms in the following documents. For undated references, the valid version applies to this standard.

HJ 536 Water quality - Determination of ammonia nitrogen - Salicylic acid spectrophotometric method HJ/T 91 Surface Water and Wastewater Monitoring Technical Specifications HJ/T 164 Technical Specifications for Groundwater Environmental Monitoring

3.1 Working principle of flow injection analyzer

In a closed pipeline, a volume of sample is injected into a continuous flow of carrier liquid, and the sample and reagent are in a chemical reaction mode.

The blocks are mixed and reacted in a specific order and proportion. Under the condition of incomplete reaction, the flow detection cell is entered for photometric inspection.

Measurement.

3.2 Principles of chemical reactions

In an alkaline medium, ammonia and ammonium ions in the sample react with hypochlorite to form chloramine. At 60 ° C and nitrosyl cyanide in the presence of potassium, chloramine reacts with salicylate to form a blue-green compound, and the absorbance is measured at a wavelength of 660 nm.

Refer to the work flow chart, as shown in Figure 1.

1-peristaltic pump 2 - injection valve 3 - reaction (mixing) ring 4 - heating pool (ring) 60 ° C 5-detection cell 10mm, 660nm R1-buffer solution (5.10) R2-chromogen (5.11) R3-sodium hypochlorite solution (5.12) S-sample C-carrier liquid W-waste liquid

Figure 1 Flow chart of flow injection-salicylic acid spectrophotometric determination of ammonia nitrogen

4 Interference and elimination

4.1

The residual chlorine in the sample will form a chloramine interference assay, which can be removed by adding an appropriate amount of sodium thiosulfate solution (5.15).

4.2

When the concentration of iron and manganese ions in the sample is greater than 500mg/L and 35mg/L, respectively, it will cause positive interference to the analysis;

The turbidity or color can interfere with the measurement. The sample can be pre-distilled

with reference to HJ 536. Calcium and magnesium ions in the sample when the chloride ion concentration is not more than 900 mg/L, 1000 mg/L and 100000 mg/L, respectively, there is no effect on the determination of ammonia nitrogen.

4.3 When the pH of the sample is >12 or pH5 reagents and materials

Unless otherwise stated, analytically pure reagents that meet national standards were used for the analysis. Experimental water is freshly prepared, resistor Ammonia-free water with a rate greater than 10 Mohm·cm. In addition to the standard solution, other solutions and experimental water are used with helium (5.17) or ultrasound.

Degas.

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

5.2 Ammonium chloride (NH_4Cl). excellent grade pure. After drying at a constant temperature of $105 \pm 5^\circ \text{C}$, it is stored in a desiccator.

5.3 sodium hydroxide (NaOH).

5.4 Ethylenediaminetetraacetic acid disodium salt ($\text{C}_{10}\text{H}_{14}\text{N}_2\text{Na}_2\text{O}_8 \cdot 2\text{H}_2\text{O}$).

5.5 Disodium hydrogen phosphate ($\text{Na}_2\text{HPO}_4 \cdot 7\text{H}_2\text{O}$)...

5.6 Sodium salicylate ($\text{NaC}_7\text{H}_5\text{O}_3$).

5.7 Sodium nitrosoferrocyanide dihydrate ($\text{Na}_2[\text{Fe}(\text{CN})_5\text{NO}] \cdot 2\text{H}_2\text{O}$).

5.8 sodium thiosulfate ($\text{Na}_2\text{S}_2\text{O}_3$).

5.9 sodium hypochlorite (NaOCl). a commercially available solution. The effective chlorine content is not less than 5.25%; see the method for determining the effective chlorine concentration.

HJ 536 Appendix A.

5.10 Buffer solution.

Weigh 30g sodium hydroxide (5.3), 25g ethylenediaminetetraacetic acid disodium salt (5.4) and 67g disodium hydrogen phosphate (5.5), dissolve After dissolving in 800 ml of water, dilute to 1000 ml with water and shake well. The solution is stable for 1 month.

5.11 Color developer. sodium salicylate solution

Weigh 144g sodium salicylate (5.6) and 3.5g sodium nitrosoferrocyanide dihydrate (5.7) dissolved in 800ml water, dissolved Dilute to 1000 ml with water and shake well. Stored in a brown bottle, the solution is stored at 4°C for 1 month.

5.12 sodium hypochlorite use solution.