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

HJ 534-2009

Replacing GB/T 14679-1993

**Ambient air. Determination of ammonia. Sodium
hypochlorite-salicylic acid spectrophotometry**

环境空气 氨的测定 次氯酸钠-水杨酸分光光度法

(English Translation)

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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" Health, standard ammonia monitoring methods, the development of this standard.

This standard specifies the sodium hypochlorite-salicylic acid spectrophotometric method for the determination of ammonia in ambient air.

This standard amends the determination of air quality ammonia by sodium

hypochlorite-salicylic acid spectrophotometry (GB/T 14679-93).

This standard was first published in 1993. The original standard drafting unit was Shenyang Institute of Environmental Sciences. This is the first revision. This revision the main contents are as follows.

- Increased sampling of ambient air.
- Identify the detection limits and lower limits of the method.
- Added a full blank of sampling.
- Combine the calculation formula.
- Added normative appendices.

As of the date of implementation of this standard, the air quality ammonia test approved and issued by the former National Environmental Protection Agency on October 27, 1993 Sodium hypochlorite-salicylic acid spectrophotometry (GB/T 14679-93) is abolished.

Appendix A of this standard is a normative appendix.

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.

Determination of ambient air ammonia - Sodium hypochlorite - salicylic acid spectrophotometric method

1 Scope of application

This standard specifies the sodium hypochlorite-salicylic acid spectrophotometric method for the determination of ammonia in ambient air.

This standard is applicable to the determination of ammonia in ambient air, and also to the determination of ammonia in the air of the foul odor source.

The method detection limit of this standard is 0.1 µg/10 ml of absorption liquid. When the total volume of the absorption liquid is 10 ml and the sampling volume is 1 to 4 L, ammonia the detection limit was 0.025 mg/m³, the lower limit of determination was 0.10 mg/m³, and the upper limit of determination was 12 mg/m³. When the total volume of the absorbent is 10 ml, when the sampling volume is 25 L, the detection limit of ammonia is 0.004 mg/m³,

and the lower limit of determination is 0.016 mg/m³.

2 Principle of the method

After the ammonia is absorbed by the dilute sulfuric acid absorption liquid, ammonium sulfate is formed. In the presence of sodium nitroferricyanide, ammonium ions are opposite to salicylic acid and sodium hypochlorite. A blue complex should be formed and the absorbance measured at a wavelength of 697 nm. The absorbance is proportional to the ammonia content, and the ammonia content is calculated based on the absorbance.

the amount.

3 Interference and elimination

If the concentration of organic amine is greater than 1 mg/m³, it will interfere with the determination and it is not applicable to this standard.

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 column of strongly acidic cation exchange resin (hydrogen type), and the effluent was collected in a ground glass bottle. Per liter of effluent Add 10 g of strong acid cation exchange resin (hydrogen type) for easy storage.

4.1.2 Distillation method

0.1 ml of sulfuric acid (4.2) was added to 1 000 ml of distilled water and redistilled in a full glass distiller. Discard the first 50 ml of distillate, then Approximately 800 ml of distillate was then collected in a ground glass vial. 10 g of strong acid cation exchange resin (hydrogen) per liter of distillate collected Type), in order to save.

4.1.3 Water Purifier Method

Prepared with a commercially available water purifier before use.

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

4.3 Sulfuric acid absorption liquid, $c(1/2 \text{ H}_2\text{SO}_4) = 0.005 \text{ mol/L}$.

2.8 ml of sulfuric acid (4.2) was added to the water and diluted to 1 L to obtain a stock solution of 0.1 mol/L. Dilute 20 times when it is ready.

4.4 Salicylic acid-sodium potassium tartrate solution

Weigh 10.0 g of salicylic acid [$\text{C}_6\text{H}_4(\text{OH})\text{COOH}$] in a 150 ml beaker, add appropriate amount of water, and add 5 mol/L sodium hydroxide solution.

15 ml, stir to dissolve completely. Also weigh 10.0 g of sodium potassium tartrate ($\text{KNaC}_4\text{H}_6\text{O}_6 \cdot 4\text{H}_2\text{O}$), dissolved in water, heated to boil the ammonia was removed, and after cooling, it was combined with the above solution and transferred to a 200 ml volumetric flask, diluted with water to the mark, and shaken. The pH of this solution is 6.0~6.5, stable in brown bottles at 2 to 5 ° C for 1 month.

4.5 sodium nitroferrocyanide solution, $\rho = 10 \text{ g/L}$.

Weigh 0.1 g of sodium nitrosodium ferricyanide [$\text{Na}_2[\text{Fe}(\text{CN})_6\text{NO}] \cdot 2\text{H}_2\text{O}$], place it in a 10 ml plug colorimetric tube, add water to dissolve it, Constant volume to the marking line, ready to use.

4.6 Sodium hypochlorite

Commercial reagents can be purchased, or they can be prepared by themselves. For detailed preparation methods, see Appendix A.1.

Sodium hypochlorite solution (stock solution) stored in plastic bottles, the effective chlorine concentration and free alkali concentration should be calibrated before each use (with NaOH) for the calibration method, see Appendix A.2 and Appendix A.3.

4.7 sodium hydroxide solution, $c(\text{NaOH}) = 2 \text{ mol/L}$.

Weigh 8.0 g of sodium hydroxide and dissolve in 100 ml of water.

4.8 sodium hypochlorite use solution, $\rho(\text{effective chlorine}) = 3.5 \text{ g/L}$, $c(\text{free base}) = 0.75 \text{ mol/L}$.

Take appropriate amount of calibrated sodium hypochlorite (4.6), dilute with water and 2 mol/L sodium hydroxide solution (4.7) to contain the effective chlorine concentration 3.5 g/L, sodium hypochlorite use solution with a free base concentration of 0.75 mol/L (as NaOH) (calculated the required dilution ratio based on the calibration results) the number or the