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HJ

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

HJ 1076-2019

**Ambient air--Determination of ammonia, methylamine,
dimethylamine and trimethylamine--Ion chromatography**

环境空气 氨、甲胺、二甲胺和三甲胺的测定 离子色谱法

(English Translation)

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Appendix A (Informative) Summary of Methods Precision and Accuracy

Foreword

In order to implement the "Environmental Protection Law of the People's Republic of China" Environment, protect human health, standardize the determination methods of ammonia, methylamine, dimethylamine and trimethylamine in ambient air quasi.

This standard specifies the determination of ammonia, methylamine, dimethylamine, and Ion chromatography of trimethylamine.

Appendix A of this standard is an informative appendix.

This standard is issued for the first time.

This standard is formulated by the Department of Eco-Environmental Monitoring, Laws and Standards Department of the Ministry of Ecology and Environment.

This standard was drafted. Dalian Ecological Environment Monitoring Center, Liaoning Province.

This standard is verified by. Shenyang Eco-environment Monitoring Center, Liaoning Province, Anshan Eco-Environment Monitoring Center, Liaoning Province, Chengdu Municipal Environmental Monitoring Center Station, Tianjin Ecological Environment Monitoring Center, Jilin City Environmental Monitoring Station, Xiamen City Environmental Monitoring Station, Jiangxi Yangzhou Environmental Monitoring Center of Jiangsu Province

and Environmental Monitoring Center Station of Inner Mongolia Autonomous Region.

This standard was approved by the Ministry of Ecology and Environment on December 31, 2019.

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This standard is explained by the Ministry of Ecology and Environment.

Ambient air. Determination of ammonia, methylamine, dimethylamine and trimethylamine. Ion chromatography Warning. The solvents and reagents used in the experiment are strongly corrosive and irritating. The reagent preparation process should be ventilated.

Carry out in the cabinet; wear protective equipment as required to avoid inhalation and contact with skin and clothing.

1 Scope

This standard specifies ion chromatography for the determination of ammonia, methylamine, dimethylamine and trimethylamine in ambient air.

This standard applies to ammonia, methylamine, dimethylamine and trimethylammonium in the air of ambient air and fixed pollution source fugitive emission monitoring points.

Determination of amines.

When the ambient air sampling volume is 30 L and the absorption volume is 10 ml, this standard ammonia, methylamine, dimethylamine and trimethylamine the detection limits are 0.003 mg/m³, 0.009 mg/m³, 0.009 mg/m³, and 0.007 mg/m³, and the lower detection limits are 0.012 mg/m³, 0.036 mg/m³, 0.036 mg/m³, and 0.028 mg/m³.

2 Normative references

This standard refers to the following documents or clauses therein. For undated references, the valid version applies to this standard.

HJ 194 Technical Specifications for Manual Monitoring of Ambient Air Quality HJ/T 55
Technical guidelines for fugitive emissions monitoring of air pollutants

3 Method principle

Ambient air samples are filtered through a filter membrane. After the target compound is absorbed by the dilute sulfuric acid absorption solution, the cation chromatography column is used to exchange the analytes.

Ionization, conductance detector detection, qualitative retention time, external standard method.

4 Reagents and materials

Unless otherwise specified, analytical reagents that comply with national standards are used in the analysis, and the experimental water is freshly prepared ammonia-free water.

4.1

Sulfuric acid. ρ (H_2SO_4) = 1.84 g/ml.

4.2

Nitric acid (HNO_3). excellent grade pure.

4.3

Methanesulfonic acid. w ($\text{CH}_3\text{SO}_3\text{H}$) $\geq 99\%$.

4.4

Ammonium chloride (NH_4Cl). excellent grade pure.

4.5

Methylamine hydrochloride ($\text{CH}_5\text{N} \cdot \text{HCl}$). 98.0%.

4.6

Dimethylamine hydrochloride ($\text{C}_2\text{H}_7\text{N} \cdot \text{HCl}$). 99.0%.

4.7

Trimethylamine hydrochloride ($\text{C}_3\text{H}_9\text{N} \cdot \text{HCl}$). 98.0%.

4.8

Sulfuric acid absorption solution. c ($1/2\text{H}_2\text{SO}_4$) = 0.01 mol/L.

Measure 2.7 ml of sulfuric acid (4.1), dilute with water to 1000 ml, and mix to prepare a 0.1 mol/L sulfuric acid solution. Before use when diluted with water 10 times.

4.9

Ammonia standard stock solution. ρ (NH_3) = 500 mg/L.

Weigh 0.3928 g of ammonium chloride (4.4) and dissolve it in water, then transfer it to a 250 ml volumetric flask and dilute it to the mark with water.

Mix well. Stored in polyethylene bottles, refrigerated below 4 ° C, protected from light and sealed for up to three months. Can also be purchased with a commercial license standard material.

4.10

Methylamine standard stock solution. ρ (CH_5N) = 500 mg/L.

Weigh 0.2772 g of methylamine hydrochloride (4.5) in water, transfer to a 250 ml volumetric

flask, and dilute to the mark with water.

Shake well, store in a polyethylene bottle, refrigerate below 4 ° C, protect from light and seal for three months. You can also buy a commercially available certificate Quasi-substance.

4.11

Dimethylamine standard stock solution. $\rho(\text{C}_2\text{H}_7\text{N}) = 500 \text{ mg/L}$.

Weigh 0.2284 g of dimethylamine hydrochloride (4.6) in water, transfer to a 250 ml volumetric flask, and dilute with water to the standard Line, shake well, store in polyethylene bottle, refrigerate below 4 ° C, protect from light and seal for three months. Can also be purchased with a commercial license standard material.

4.12

Trimethylamine standard stock solution. $\rho(\text{C}_3\text{H}_9\text{N}) = 500 \text{ mg/L}$.

Weigh 0.2063 g of trimethylamine hydrochloride (4.7) to dissolve in water, transfer to a 250 ml volumetric flask, and dilute with water to the standard Line, shake well, store in a polyethylene bottle, refrigerate below 4 ° C, protect from light and seal for three months. Commercially available Certified reference materials.

4.13 Mixed Standard Use Solution

According to the measured ion concentration range and detection sensitivity, the standard use solution can be prepared. Pipette 5.00 ml ammonia standards separately Stock solution (4.9), 20.0 ml standard methylamine stock solution (4.10), 20.0 ml standard dimethylamine stock solution (4.11), and 20.0 ml Trimethylamine standard stock solution (4.12) was placed in a 250 ml volumetric flask, diluted with water to make it to the mark, and mixed.

Formulated to contain A mixed standard of 10.0 mg/L ammonia, 40.0 mg/L methylamine, 40.0 mg/L dimethylamine, and 40.0 mg/L trimethylamine makes the standard with liquid. Stored in polyethylene bottles, refrigerated, protected from light and sealed at 4 ° C or lower for one month.

4.14 Stock solution of methanesulfonic acid. $c(\text{CH}_3\text{SO}_3\text{H}) = 1 \text{ mol/L}$.

Pipette 32.0 ml of methanesulfonic acid (4.3) into an appropriate amount of water, then transfer to a 500 ml volumetric flask and dilute with water to the standard Line and mix. Stored in polyethylene plastic bottles, refrigerated below 4 ° C, and stored in the dark for two years.

4.15 Use solution of methanesulfonic acid. $c(\text{CH}_3\text{SO}_3\text{H}) = 22 \text{ mmol/L}$.

Pipette 44.0 ml of mesylate eluent stock solution (4.14) into a 2000 ml volumetric flask, dilute with water to the mark, and mix.

Provisional use.