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

HJ 1040-2019

**Stationary source emission - Determination of hydrogen
bromide - Ion chromatography**

固定污染源废气 溴化氢的测定 离子色谱法

(English Translation)

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Foreword

In order to implement the "Environmental Protection Law of the People's Republic of China" Environment, protect human health, standardize the determination method of hydrogen bromide in exhaust gas from fixed pollution sources, and formulate this standard.

This standard specifies ion chromatography for the determination of hydrogen bromide in exhaust gas from stationary pollution sources.

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. Shandong Ecological Environment Monitoring Center.

Verification units of this standard. Tianjin Ecological Environment Monitoring Center, Shandong Jinan Ecological Environment Monitoring Center, Shandong Province Island Ecological Environment Monitoring Center, Shandong Province Tai'an Ecological Environment Monitoring Center, Shandong Binzhou Ecological Environment Monitoring Center, Shandong Provincial Institute of Product Quality Inspection.

This standard was approved by the Ministry of Ecology and Environment on October 24, 2019.

This standard will be implemented from April 24, 2020.

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

Determination of hydrogen bromide from exhaust gas from stationary sources. Ion chromatography WARNING. Hydrogen bromide is harmful to the human body. Samplers should pay attention to wearing protective equipment to avoid inhalation or contact with skin.

1 Scope

This standard specifies the determination of hydrogen bromide in the air from fixed sources of pollution, organized emissions and fugitive emissions monitoring points.

Subchromatography.

This standard is applicable to the determination of hydrogen bromide in the air of fixed pollution sources, organic emissions and fugitive emissions monitoring points.

For organized exhaust, when the sample volume is 20 L (standard state) and the fixed volume is 50.0 ml, the method the detection limit was 0.05 mg/m³, and the lower detection limit was 0.20 mg/m³.

For fugitive emission monitoring point air, when the sampling volume is 30 L (standard state) and the constant volume is 10.0 ml, the detection limit of the method was 0.008 mg/m³, and the lower detection limit was 0.032 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.

GB/T 16157 Determination of particulate matter and sampling of gaseous pollutants in exhaust from stationary sources HJ/T 55 Technical guidelines for fugitive emissions monitoring of air pollutants HJ/T 397 Fixed source exhaust gas monitoring technical specifications

3 Terms and definitions

The following terms and definitions apply to this standard.

Hydrogen bromide

Hydrogen bromide determined by this standard refers to hydrogen bromide in the form of gaseous and mist droplets.

4 Method principle

Fixed sources of pollution include organized emission of exhaust gas and fugitive emission of hydrogen bromide in the air at monitoring points, which are absorbed to form bromine ions are separated by ion chromatography and detected by a conductivity detector. Qualitative based on retention time, quantitative peak height or area.

5 Interference and cancellation

Particulate bromide interferes with the measurement. Use PTFE or quartz filter to eliminate the interference. Gaseous bromine test There must be interference. The use of acidic absorption solution to absorb hydrogen bromide can eliminate the interference. Organic pollutants interfere with ion chromatography, Eliminate interference with activated solid phase extraction columns such as C18.

6 Reagents and materials

Unless otherwise specified, analytical reagents that meet national standards are used. Experimental water is resistivity $\geq 18 \text{ Mohm} \cdot \text{cm}$ of fresh deionized water.

6.1

Sodium hydroxide (NaOH). excellent grade pure.

6.2

Potassium hydroxide (KOH). excellent grade pure.

6.3

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

6.4

Potassium bromide (KBr). Excellent purity.

Before use, it should be dried at $105^\circ \text{C} \pm 5^\circ \text{C}$ for 2 hours, and placed in a desiccator for cooling.

6.5

Bromide stock solution. $\rho(\text{Br}^-) = 1000 \text{ mg/L}$.

Weigh 1.4875 g of potassium bromide (6.4) and dissolve it in an appropriate amount of water. Transfer it to a 1000 ml volumetric flask.

Move to a polyethylene bottle. It can be stored for 1 month in refrigerated, protected from light and sealed below 4°C . Commercially available certified standard solutions are also available.

6.6

Standard bromide solution. $\rho(\text{Br}^-) = 100 \text{ mg/L}$.

Take 10.00 ml bromide stock solution (6.5), put it in a 100 ml volumetric flask, make up to volume with water, mix well, and use immediately Match.

6.7

Alkaline absorption solution. $c(\text{NaOH}) = 35 \text{ mmol/L}$ or $c(\text{KOH}) = 35 \text{ mmol/L}$.

Weigh 1.40 g of sodium hydroxide (6.1) or 1.96 g of potassium hydroxide (6.2), dissolve in an appropriate amount of water and transfer to a 1000 ml volume in a measuring flask, make up to volume with water, mix well, and transfer to a polyethylene bottle. Provisional use.

6.8

Sulfuric acid absorption solution. $c(\text{H}_2\text{SO}_4) = 50 \text{ mmol/L}$.

Take 2.7 ml of sulfuric acid (6.3), slowly add an appropriate amount of water, and after cooling, transfer it to a 1000 ml volumetric flask, and set it with water.

Content, mix well and transfer to a polyethylene bottle. Refrigerated and sealed below 4 °C can be stored for 3 months.

6.9

Eluent stock solution. Prepare according to the model of the instrument and the operating conditions of the column. Refrigerated and sealed below 4 °C Save for 3 months.

6.10

Eluent. Dilute the eluent stock solution (6.9) to obtain the eluent.

6.11

Sodium hydroxide solution. $c(\text{NaOH}) = 5.0 \text{ mol/L}$.

Weigh 20.0 g of sodium hydroxide (6.1), dissolve in an appropriate amount of water, transfer to a 100 ml volumetric flask, make up to volume with water, mix well, Transfer to a polyethylene bottle. Refrigerated and sealed below 4 °C can be stored for 3 months.

6.12

Disposable microporous membrane syringe filter. pore size $\leq 0.45 \mu\text{m}$.

6.13

Polytetrafluoroethylene or quartz filter membrane. The retention efficiency of particles with a particle size larger than $0.3 \mu\text{m}$ is not less than 99.9%.