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

HJ 483-2009

Replacing GB 8970-1988

**Ambient air. Determination of sulfur dioxide.
Tetrachloromercurate(TCM)-pararosaniline method**

环境空气 二氧化硫的测定 四氯汞盐吸收-副玫瑰苯胺分光光度法 含2018年第1号
修改单

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Foreword

To protect the environment and protect people in order to implement the Environmental Protection Law of the People's Republic of China and the Law of the People's Republic of China on the Prevention and Control of Air Pollution this standard is established for the determination of sulfur dioxide in ambient air.

This standard specifies the tetrachloromercury absorption-pararosaniline spectrophotometric method for the determination of sulfur dioxide in ambient air.

This standard is for the determination of air quality of sulfur dioxide, tetrachloromercury salt - pararosaniline hydrochloride colorimetric method (GB/T 8970-88) Revision.

This standard was first published in 1988, and the original standard drafting unit was the Beijing Environmental Protection Monitoring Center. This is the first revision.

The main revisions are as follows.

-- Change the name of the standard to "Determination of Ambient Air Sulphur Dioxide - Tetrachloromercury Salt Absorption - Pararosaniline Spectrophotometry";

- increased the content of the warning;

- clarify the standard detection limits and measurement range;
- Increased the number of times the standard solution is calibrated in parallel;
- Added field blank test;
- Improved the calculation formula for the concentration of sodium thiosulfate solution and the determination result of sulfur dioxide in air;
- Added quality assurance and quality control provisions, specified requirements for the quality of the absorption tube of the porous glass plate; emphasized the effect of temperature on sampling the effect of the rate; the requirement for the slope of the calibration curve is relaxed;
- Added waste disposal provisions.

From the date of implementation of this standard, the national environmental protection standard "Air" approved and issued by the former National Environmental Protection Agency on March 26, 1988.

Determination of quality sulphur dioxide The tetrachloromercury salt-para-rosaniline hydrochloride colorimetric method (GB 8970-88) is abolished.

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 September 27, 2009.

This standard has been implemented since November 1, 2009.

This standard is explained by the Ministry of Environmental Protection.

Determination of ambient air sulfur dioxide Tetrachloromercury salt absorption-pararosaniline spectrophotometry Warning. Potassium tetrachloromercurate solution is a highly toxic reagent. When operating, wear protective equipment as required to avoid contact with skin and clothing.

The preparation of the quasi-solution should be carried out in the fume hood; the residual residue after the test should be properly and safely disposed.

1 Scope of application

This standard specifies the tetrachloromercury absorption-pararosaniline spectrophotometric method for the determination of sulfur dioxide in air.

This standard applies to the determination of sulfur dioxide in ambient air.

When 5 ml of absorption solution is used and the sampling volume is 30 L, the detection limit of sulfur dioxide in the air is determined to be 0.005 mg/m³.

The limit is 0.020 mg/m³ and the upper limit of determination is 0.18 mg/m³.

When 50 ml of absorption solution is used and the sampling volume is 288 L, the detection limit of sulfur dioxide in the air is determined to be 0.005 mg/m³.

The lower limit is 0.020 mg/m³ and the upper limit of determination is 0.19 mg/m³.

2 Principle of the method

After the sulfur dioxide is absorbed by the potassium tetrachloromercurate solution, a stable dichlorosulfite complex is formed, which is then reacted with formaldehyde and pararosaniline hydrochloride.

Use to generate a purple-red complex and measure the absorbance at 575 nm.

3 Interference and elimination

The main interferents of the method are nitrogen oxides, ozone, manganese, iron, chromium and the like. The addition of ammonium sulfamate eliminates the interference of nitrogen oxides;

After the sample is placed for a period of time, the ozone can be decomposed by itself; adding phosphoric acid and ethylenediaminetetraacetic acid disodium salt can eliminate or reduce certain heavy metals.

Ion interference.

4 Reagents and materials

Analytically pure reagents that meet national standards are used for analysis, and experimental water is newly prepared distilled water or equivalent purity unless otherwise stated.

Water.

4.1

Potassium iodate (KIO₃), excellent grade, dried at 110 ° C for 2 h.

4.2

Potassium iodide (KI).

4.3

Glacial acetic acid (CH₃COOH).

4.4

Potassium tetrachloromercury (TCM) absorption solution, $c(\text{TCM})=0.04 \text{ mol/L}$. Weigh 10.9 g of mercury dichloride, 6.0 g of potassium chloride and 0.070 g of B Diamine tetraacetic acid disodium salt (EDTA-2Na) was dissolved in water and diluted to 1 L. This solution is stored in a closed container and is stable for 6 months.

If precipitation is found, it can not be reused.

4.5

Formaldehyde solution, $\rho(\text{HCHO}) \sim 2 \text{ g/L}$. Measure 1 ml 36% ~ 38% (mass fraction) formaldehyde solution, diluted to 200 ml, use Now available.

4.6

Ammonium sulfamate solution, $\rho(\text{H}_2\text{NSO}_3\text{NH}_4) = 6.0 \text{ g/L}$. Weigh 0.60 g of ammonium sulfamate dissolved in 100 ml of water, ready for use.

4.7

Iodine stock solution, $c(1/2 \text{ I}_2)=0.10 \text{ mol/L}$. Weigh 12.7 g of iodine (I_2) in a beaker, add 40 g of potassium iodide and 25 ml of water, stir Stir until completely dissolved, dilute to 1 000 ml with water, and store in a brown bottle.

4.8

Iodine solution, $c(1/2 \text{ I}_2)=0.010 \text{ mol/L}$. Take iodine stock solution (4.7) 50 ml, dilute with water to 500 ml, store in brown fine mouth in the bottle.

4.9

Starch solution, $\rho(\text{starch}) = 5.0 \text{ g/L}$. Weigh 0.5 g of soluble starch in a 150 ml beaker and make a paste with a small amount of water.

Slowly pour 100 ml of boiling water, continue to boil until the solution is clear, cool and store in the reagent bottle.

4.10

potassium iodate reference solution, $c(1/6 \text{ KIO}_3) = 0.100 0 \text{ mol/L}$. accurately weigh 3.566 7 g potassium iodate (4.1) dissolved in water, moved into in a 1 000 ml volumetric flask, dilute with water to the mark and shake.

4.11

Hydrochloric acid solution, $c(\text{HCl}) = 1.2 \text{ mol/L}$. Measure 100 ml of concentrated hydrochloric acid and add to 900 ml of water.

4.12

Standard stock solution of sodium thiosulfate, $c(\text{Na}_2\text{S}_2\text{O}_3)=0.10 \text{ mol/L}$. Weigh 25.0 g of sodium thiosulfate ($\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$), dissolve in 1 000 ml of freshly boiled but cooled