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

HJ 482-2009

Replacing GB/T 15262-1994

**Ambient air. Determination of sulfur dioxide. Formaldehyde
absorbing-pararosaniline spectrophotometry**

环境空气 二氧化硫的测定 甲醛吸收-副玫瑰苯胺分光光度法 含2018年第1号修改
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(English Translation)

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Table of Contents

Foreword

1 Scope of application

2 Principle of the method

3 Interference and elimination

4 Reagents and materials

5 Instruments and equipment

6 Sample collection and preservation

7 Analysis steps

7.1 Drawing of the calibration curve

7.2 Sample determination

8 Results are expressed

9 Precision and accuracy

9.1 Precision

9.2 Accuracy

10 Quality Assurance and Quality Control

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 air.

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

This standard is for the determination of sulfur dioxide in ambient air - formaldehyde absorption - pararosaniline spectrophotometry (GB/T 15262-94) Revision.

This standard was first published in 1994. The original standard drafting unit was the Shanghai Environmental Monitoring Center. This is the first revision.

The main revisions are as follows.

- clarify the standard detection limits and measurement range;
- Revised the concentration of the iodine solution and sodium thiosulfate solution used to calibrate the sulfur dioxide standard solution;

- Added field blank test;
- Improve the calculation formula of the results;
- Added quality assurance and quality control provisions. Increased requirements for the quality of the absorption tube of the porous glass plate; emphasis on temperature versus sampling efficiency the effect of the rate; the requirement for the slope of the calibration curve is relaxed.

This standard is the national environmental protection standard approved by the former Environmental Protection Agency on October 26, 1994.

Determination of sulphur dioxide in airborne formaldehyde absorption - pararosaniline spectrophotometry (GB/T 15262-94) 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 Formaldehyde absorption-pyro-aniline spectrophotometry

1 Scope of application

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

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

When 10 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 0.007 mg/m³.

The limit is 0.028 mg/m³ and the upper limit of determination is 0.667 mg/m³.

When 50 ml of absorption solution is used, the sampling volume is 288 L, and the test volume is 10 ml, the detection limit of sulfur dioxide in the air is determined as 0.004 mg/m³, the lower limit of determination is 0.014 mg/m³, and the upper limit of determination is 0.347 mg/m³.

2 Principle of the method

After the sulfur dioxide is absorbed by the formaldehyde buffer solution, a stable methylolsulfonic acid addition compound is formed, and sodium hydroxide is added to the sample solution.

The addition compound is decomposed, and the released sulfur dioxide reacts with pararosaniline and formaldehyde to form a purple-red compound, which is spectrophotometer.

The absorbance is measured at a wavelength of 577 nm.

3 Interference and elimination

The main interferents in this standard are nitrogen oxides, ozone and certain heavy metal elements. After being sampled for a period of time, the ozone can be decomposed by itself;

Adding sodium sulfamate solution can eliminate the interference of nitrogen oxides; adding phosphoric acid and cyclohexanediaminetetraacetic acid disodium salt to the absorption solution can eliminate or reduce Interference from certain metal ions. 10 ml sample solution contains 50 µg of metal ions such as calcium, magnesium, iron, nickel, cadmium, copper and 5 µg of divalent manganese in the case of ions, there is no interference with the measurement of the method. When the 10 ml sample solution contains 10 µg of divalent manganese ions, the absorbance of the sample can be made.

Reduced by 27%.

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

Sodium hydroxide solution, c (NaOH) = 1.5 mol/L. Weigh 6.0 g NaOH, dissolved in 100 ml of water.

4.3

Cyclohexanediaminetetraacetic acid disodium solution, c (CDTA-2Na) = 0.05 mol/L. Weigh 1.82 g of trans 1,2-cyclohexanediaminetetraacetic acid

[(trans-1,2-cyclohexylenedinitrilo)tetraacetic acid, abbreviated as CDTA], add NaOH solution (4.2) 6.5 ml, Dilute to 100 ml of water.

4.4

Formaldehyde buffer absorption stock solution. draw 36%~38% formaldehyde solution 5.5 ml, CDTA-2Na solution (4.3) 20.00 ml; weigh 2.04 g Potassium hydrogen phthalate dissolved in a small amount of water; combine the three solutions, dilute to 100 ml with water, and store in the refrigerator for 1 year.

4.5

Formaldehyde buffer absorption solution; dilute the formaldehyde buffer absorption stock solution (4.4) by 100 times with water. Available at the time of use.

4.6

Sodium sulfamate solution, $\rho(\text{NaH}_2\text{NSO}_3)=6.0 \text{ g/L}$. Weigh 0.60 g of sulfamic acid $[\text{H}_2\text{NSO}_3\text{H}]$ in a 100 ml beaker and add 4.0 ml of sodium hydroxide (4.2), stir well with water until completely dissolved, dilute to 100 ml, shake well. This solution is sealed for 10 days.

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 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.