

ICS 13.040.40
CCS Z 25

HJ

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

HJ 1079-2019

**Stationary source emission--Determination of
chlorobenzenes--Gas chromatography**

固定污染源废气 氯苯类化合物的测定 气相色谱法

(English Translation)

Issued on: January 1, 1970

Implemented on: June 30, 2020

Issued by: Ministry of Ecology and Environment

Table of Contents

Foreword

1 Scope of application

2 Normative references

3 Method principle

4 Reagents and materials

5 Instruments and equipment

6 Samples

6.1 Sample collection

6.2 Storage of samples

6.3 Preparation of samples

6.4 Preparation of blank samples

7 Analysis steps

7.1 Reference analysis conditions of gas chromatography

7.2 Establishment of standard curve

7.3 Determination of samples

7.4 Blank test

8 Calculation and presentation of results

8.1 Qualitative analysis

8.2 Calculation of results

8.3 Results

79 Precision and accuracy

Foreword

To implement the Environmental Protection Law of the People 's Republic of China and the Air Pollution Prevention and Control Law of the People 's Republic of Environment, protect human health, regulate the measurement of chlorobenzene compounds in the air of fixed pollution sources and fugitive emission monitoring points Determine the method and formulate this standard.

This standard stipulates the determination of chlorobenzene, 2-chlorotoluene and 3-chloromethyl in the air of stationary pollution sources and fugitive emission monitoring points Benzene, 4-chlorotoluene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,3,5-trichlorobenzene, 1,2,4-trichlorobenzene , 1, 2, 3-Gas

chromatographic method of 10 kinds of chlorobenzene compounds such as chlorobenzene.

This standard refers to the "Gas Chromatography Method for the Determination of Chlorobenzenes in the Exhaust of Stationary Pollution Sources" (HJ/T 39-1999) and the "Atmosphere Amendment to the determination of chlorobenzene compounds from stationary sources by gas chromatography (HJ/T 66-2001).

"Determination of Chlorobenzenes in Exhaust Gas from Stationary Sources of Gas Chromatography" (HJ/T 39-1999) was published in 1999, the original the standard was drafted by the Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences; Gas Chromatography (HJ/T 66-2001) was released in 2001. The original standard drafting unit was Shenyang Environmental Monitoring Center Station.

This standard is the first revision of the above two standards. The main contents of the revision are as follows.

- The standard name was revised to "Determination of Chlorinated Benzene Compounds from Stationary Pollution Source Gas Chromatography"-Added target compounds, chlorobenzene compounds increased from 3 to 10;
- Revised the detection limit of the method;
- Added activated carbon adsorption sampling method;
- Added the installation diagram of waste gas sampling system of fixed pollution source;
- Added quality assurance and quality control requirements.

Since the implementation of this standard, "Determination of Chlorobenzenes in Exhaust Gas from Stationary Pollution Sources by Gas Chromatography" (HJ/T 39-1999) at the same time as the "Gas Chromatography Method for the Determination of Chlorobenzenes from Stationary Air Pollution Sources" (HJ/T 66-2001).

Appendix A of this standard is a normative appendix, and Appendix B and Appendix C are informative appendices.

This standard is organized and revised by the Eco-Environmental Monitoring Department and the Regulations and Standards Department of the Ministry of Ecology and Environment.

1 Scope of application

This standard stipulates the determination of the gas phase color of chlorobenzene compounds in the air of stationary pollution sources and fugitive emission monitoring points
Notation.

This standard is applicable to chlorobenzene, 2-chlorotoluene, 3-chlorotoluene, 4-chlorotoluene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene,

1,3,5-trichlorobenzene, 1,2,4-trichlorobenzene, 1, 2,3-Trichlorobenzene Determination of 10 kinds of chlorobenzene compounds.

When the sampling volume of waste gas from a fixed pollution source is 10 L (standard state) and the volume of desorption liquid is 2.00 ml, the detection limit of the method 0.02 mg/m³ ~ 0.04 mg/m³, the lower limit of determination is 0.08 mg/m³ ~ 0.16 mg/m³;

When the gas sampling volume is 30 L (standard state) and the desorption solution volume is 1.00 ml, the method detection limit is 0.007 mg/m³ ~ 0.01 mg/m³, the lower limit of determination is 0.028 mg/m³ ~ 0.04 mg/m³; see Appendix A for details.

2 Normative references

This standard refers to the following documents or their clauses. For the cited documents without date, the valid version applies to this standard.

GB/T 16157 Determination of particulate matter in exhaust gas from stationary sources and sampling method of gaseous pollutants Technical conditions of HJ/T 47 flue gas sampler HJ/T 55 Technical Guidelines for the Monitoring of Unorganized Emissions of Air Pollutants HJ/T 373 Technical Specifications for Quality Assurance and Quality Control of Fixed Pollution Source Monitoring (Trial) Technical requirements and testing methods of HJ/T 375 ambient air sampler HJ/T 397 Fixed source exhaust gas monitoring technical specification

3 Method principle

Chlorobenzene compounds in the air from stationary pollution sources and fugitive emission monitoring points are passed through GDX-103 adsorbent (styrene-Divinylbenzene polymer) or activated carbon adsorbent, after desorption with carbon disulfide, the desorption liquid is separated by capillary gas chromatography it is detected by hydrogen flame ionization detector, qualitative according to retention time, and quantified by external standard method.

4 Reagents and materials

Unless otherwise specified, analytically pure reagents that meet national standards are used in the analysis, and the experimental water is newly prepared without a target Pure water of the compound.

24.1 Carbon disulfide (CS₂). chromatographically pure, tested without interference peaks under the reference analysis conditions of gas chromatography (7.1) the target compound concentration in the medium is below the detection limit of the method.

4.2

Dichloromethane (CH₂Cl₂). chromatographically pure.

4.3

Acetone (C₃H₆O). chromatographically pure.

4.4

Acetone-dichloromethane mixed solution. 19, ready for use immediately.

4.5

Standard stock solution. $\rho = 1000 \mu\text{g/ml}$.

Direct purchase of commercially available certified chlorobenzene standard solutions (carbon disulfide media), in accordance with the standard solution certificate requirements it can also be prepared by using chlorobenzene standard compounds. After the standard stock solution is opened, the the screwed brown compact bottle (5.5) is cryopreserved and stored for 3 months.

4.6

Standard use solution. $\rho = 100 \mu\text{g/ml}$.

Pipette the standard stock solution (4.5) of chlorobenzene compounds, dilute with carbon disulfide (4.1), and mix to a constant volume. Standard use the solution is cryogenically stored in a brown tight bottle (5.5) with a Teflon liner screw cap, and the storage period is 1 month.

4.7

Adsorption sampling tube.

4.7.1

GDX-103 adsorption sampling tube.

The sampling tube is made of glass, the specification is $\Phi 6 \times (80 \sim 120)$ mm, and the two-stage particle size is $250 \mu\text{m} \sim 380 \mu\text{m}$ (60 Mesh $\sim$ 40 mesh) GDX-103 adsorbent (styrene-divinylbenzene polymer), of which 100 mg in section A (sampling section), Section B (indication section) 50 mg, see Figure 1 for details. Commercially available sampling tubes can be purchased.

The GDX-103 adsorbent was extracted with dichloromethane (4.2) under reflux for 16 h before use, and then mixed with acetone-dichloromethane (4.4) Continue reflux extraction for 16 h, then place in a fume hood to evaporate the solvent to dryness (or use vacuum drying at 50 °C for 8 h), Store in a sealed glass jar.

4.7.2

Activated carbon adsorption sampling tube.

The sampling tube is made of glass, the specification is $\Phi 6 \times (80 \sim 120)$ mm, and the two-stage particle size is $380 \mu\text{m} \sim 830 \mu\text{m}$ (40 Mesh $\sim$ 20 mesh) Coconut shell activated