

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

HJ 1006-2018

**Stationary source emission - Determination of volatile
halogenated hydrocarbons - Bags sampling-gas
chromatography**

固定污染源废气 挥发性卤代烃的测定 气袋采样-气相色谱法

(English Translation)

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Foreword

To protect the "Environmental Protection Law of the People's Republic of China" and the "Air Pollution Control Law of the People's Republic of China" this standard is formulated to ensure the health of human body and to regulate the determination of volatile halogenated hydrocarbons in fixed source waste gas.

This standard specifies gas chromatography for the determination of volatile halogenated hydrocarbons in fixed source exhaust gases.

Appendix A of this standard is a normative appendix, and Appendix B is an informative appendix.

This standard is the first release.

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

This standard was drafted. Dalian Environmental Monitoring Center.

This standard is verified by. Shenyang Environmental Monitoring Center Station, Qingdao Environmental Monitoring Center Station, and Anshan City Environmental Monitoring Xinzhan, Tianjin Ecological Environment Monitoring Center, Fushun Environmental Monitoring Center Station and Xiamen Environmental Monitoring Center Station.

This standard is approved by the Ministry of Ecology and Environment on December 26, 2018.

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

1 Determination of volatile halogenated hydrocarbons from fixed pollution sources

Air bag sampling - gas chromatography

1 Scope of application this standard specifies gas chromatography for the determination of volatile halogenated hydrocarbons in fixed source exhaust gases.

This standard is applicable to methyl chloride, vinyl chloride, methyl bromide, ethyl bromide, chloropropene, dichloromethane in fixed pollution source exhaust gas.

Chloroprene, chloroform, carbon tetrachloride, 1,2-dichloroethane, trichloroethylene, 1,2-dichloropropane, epichlorohydrin, Determination of 14 volatile halogenated hydrocarbons such as tetrachloroethylene.

When the injection volume is 1.0 ml, the detection limit of the method is 0.0003 mg/m³ to 0.6 mg/m³, and the lower limit of determination is 0.0012 mg/m³ to 2.4 mg/m³, see Appendix A for details.

2 Normative references

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

GB/T 16157 Determination of particulate matter in fixed pollution source exhaust gas and sampling method of gaseous pollutants HJ 732 Sampling air bag method for fixed volatile waste gas HJ/T 48 soot sampler technical conditions HJ/T 397 Fixed Source Exhaust Gas Monitoring Technical Specification

3 Principle of the method

The volatile halogenated hydrocarbons in the fixed pollution source are collected in air bags, directly injected, separated by gas chromatography, and electron trapped.

Detected by an detector (ECD), characterized by retention time, and quantified by external standard method.

4 Reagents and materials

4.1

Volatile halogenated hydrocarbon standard gas. Purchase commercially available certified standard gas. See Table 1 for reference concentrations.

Table 1 Reference concentration of each component in the mixed gas

Serial number compound name Standard gas volume fraction (μmol/mol) 1 carbon

tetrachloride, tetrachloroethylene 0.0100 2 chloroform, trichloroethylene 0.100 3
chloroprene 1.00 4 dichloromethane, 1,2-dichloroethane, 1,2-dichloropropane, methyl
bromide, ethyl bromide, chloroprene 10.0 2 continued Serial number compound name
Standard gas volume fraction ($\mu\text{mol/mol}$)

5 Methyl chloride, vinyl chloride, epichlorohydrin 50.0

4.2 Nitrogen. purity $\geq 99.999\%$.

5 instruments and equipment

5.1

Gas Chromatograph. with split/splitless inlet, electron capture detector (ECD).

5.2

Quartz capillary column. 30 m x 0.25 mm x 1.40 μm , stationary phase 6% cyanopropyl phenyl and 94% dimethyl polysilicon Oxytomane. Other equivalent capillary columns can also be used.

5.3

Air bag. Polyvinyl fluoride (PVF) material or other equivalent material air bag.

5.4

Air bag sampling system. see Figure 1.

1-exhaust pipe; 2-glass wool filter; 3-Teflon connecting pipe; 4-heated sampling pipe; 5-fast joint male head; 6-fast joint female head;

7-air bag; 8-vacuum box; 9-valve; 10--activated carbon filter; 11-exhaust pump.

Figure 1 Air bag sampling system

5.5

Sampling tube. hard glass or polyethylene. The inner diameter should be greater than 6 mm and should be attached to a temperature above 120 $^{\circ}\text{C}$.

Insulation jacket.

5.6

Smoke sampler. It has the module to measure the moisture content of the flue gas and the temperature of the flue gas. The performance of the instrument complies with the requirements of HJ/T 48.

5.7

Gas dilution unit. Accuracy is better or better than 2%.

5.8

Oven. The temperature can reach 130 ° C with an accuracy of ± 1 ° C.

5.9

Hermetic syringe. 1.0 ml.

5.10

Common instruments and equipment used in general laboratories.

36 Samples

6.1 Sample collection

6.1.1 Fixed pollution source exhaust sampling position and sampling point, sampling frequency, sampling time and sampling operation Relevant provisions of GB/T 16157, HJ/T 397 and HJ 732.

6.1.2 Connect the air bag sampling device (5.4) as shown in Figure 1. Start the air pump and turn off the air pump after the bag is full.

Remove the sampling bag seal. If the temperature of the exhaust gas in the exhaust pipe is higher than the ambient temperature during sampling, turn on the sampling tube (5.5) for heating.

For the power supply, heat the sampling tube (5.5) to $120\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.

6.1.3 Determine the moisture content in the exhaust pipe by the smoke sampler (5.6). The operation steps are related to GB/T 16157.

Provisions.

Note: This method can only collect samples with temperatures below 150 °C.

6.2 Transport blank sample Take a sample and collect an air bag of the same batch, fill it in the laboratory with nitrogen, and bring it to the sampling site without sample collection.

Shipped back to the laboratory along with the sample as a blank sample for transport.

6.3 Sample preservation Samples were stored in the dark after collection and analyzed within 24 h after sampling.

6.4 Laboratory blank samples Take a sample of the same batch of an air bag, fill the laboratory with nitrogen, save the laboratory in the dark, as a laboratory empty White sample.

7 Analysis steps

7.1 Instrument Reference Conditions Inlet temperature. 150 ° C; detector temperature. 280 ° C; column flow. 1.5 ml/min; split ratio. 5.1;