

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

HJ 919-2017

**Ambient air--Determination of volatile organic
compounds--Portable fourier infrared spectrometer method**

环境空气 挥发性有机物的测定 便携式傅里叶红外仪法

(English Translation)

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Table of Contents

Foreword .ii
1 Scope of application .1
2 Normative references .1
3 Method principle .1
4 Interference and elimination .1
5 Reagents and materials .1
6 Instruments and equipment .2
7 Samples .2
8 Analysis steps .3
9 Results Calculation and Representation .3
10 Precision and accuracy
11 Quality Assurance and Quality Control .4
12 Matters needing attention
Appendix A (Normative) Method detection limit and lower limit of determination .5
Appendix B (informative) Characteristics of eight volatile organic compounds Infrared vibration frequency
Appendix C (informative) FT-IR spectra of 8 volatile organic compounds standard substance Figure
Appendix D (Informative) Precision and accuracy

Foreword

In order to implement the Law of the People's Republic of China on Environmental Protection and the Law of the People's Republic of China on Prevention and Control of Atmospheric Pollution, this standard is formulated by the portable Fourier infrared method for the protection of human health and the determination of volatile organic compounds in ambient air.

This standard specifies the determination of ambient air propane, ethylene, propylene, acetylene, benzene, toluene, ethylbenzene, styrene and other 8 Volatile Organic Compounds Portable Fourier Transform Infrared Spectroscopy.

This standard Appendix A normative appendix, Appendix B ~ Appendix D is an informative annex.

This standard is released for the first time.

This standard by the Environmental Protection Department of Environmental Monitoring Division and Science and Technology Standards Division to develop.

This standard was drafted. Jiangsu Provincial Environmental Monitoring Center.

This standard verification unit. Jiangsu Province Environmental Monitoring Center, Yangzhou City Environmental Monitoring Center Station, Suzhou City Environmental Monitoring Center Station, Taizhou City Environmental Monitoring Center Station, Lianyungang City Environmental Monitoring Center Station and Jiangyin City Environmental Monitoring Station.

This standard MEP approved on December 28, this standard since April 1, 2018 come into operation.

This standard is interpreted by the MEP.

Ambient air - Determination of volatile organic compounds - Portable Fourier transform infrared spectroscopy

1 Scope of application

This standard specifies the portable Fourier infrared method for the determination of volatile organic compounds in the ambient air.

This standard is a qualitative semi-quantitative method for ambient air propane, ethylene, propylene, acetylene, benzene, toluene, B Benzene, styrene and other 8 kinds of volatile organic compounds in the case of non-interference of emergency environmental emergencies monitoring. Other volatile there If the object can also be verified by this method of determination.

The detection limits and determination of the method in Appendix A.

2 Normative references

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

HJ 589 emergency environmental monitoring technical specifications

3 Method principle

When the wavelength of continuous changes in the infrared light irradiation of the target compound molecules to be tested, the molecular natural vibration frequency of the same specific the infrared light of the wavelength is absorbed, the infrared light of the irradiated molecule is dispersed by a monochromator, arranged in order of their wavenumbers, and the difference is measured the intensity of the wave number being absorbed gives the infrared absorption spectrum. According to the sample infrared absorption spectra and the

standard material to determine the degree of fit Sex, according to the characteristics of the absorption peak intensity semi-quantitative.

4 Interference and elimination

4.1

mixed sample concentration of a component relative to other components is too high, the component of the broad base of the absorption peak of other components Analysis of the interference.

4.2

When the infrared spectra of two or more components in a mixed sample overlap each other, they interfere with the analysis.

4.3

When the air relative humidity is greater than 85%, the excess moisture in the sample will interfere with the analysis results, you can use dehumidification Device or other equivalent method to reduce the humidity in the air.

4.4

When there is a large amount of dust in the sample, it will pollute the instrument pipeline and analysis unit, which will interfere with the analysis result. Install the dust filter (5.2) in front of the sample tube.

5 Reagents and materials

5.1

high purity nitrogen. purity $\geq 99.999\%$.

5.2

Dust filter. glass fiber or other non-volatile adsorption of organic materials, pore size $\leq 2 \mu\text{m}$.

5.3

Teflon gas pipe.

6.1 Portable Fourier infrared instrument

Spectral range. contains $900 \sim 4000 \text{ cm}^{-1}$; Spectral resolution. not more than 16 cm^{-1} ; optical path length. not less than 1 m.

Instrument structure diagram shown in Figure 1.

Figure 1 instrument structure diagram

6.2 Auxiliary equipment

6.2.1

Battery.

6.2.2

Thermometer.

6.2.3

Atmospheric pressure gauge.

6.2.4

Hygrometer.

6.2.5

Sampling dehumidification device. does not adsorb volatile organic compounds, can reduce the relative humidity of the gas sample below 85% Set (such as semiconductor refrigerators, compressor chillers, liquid nitrogen refrigerators, etc.).

7.1 Sampling preparation

7.1.1

Install PTFE air pipe (5.3), dust filter (5.2) and sample dehumidifier before the air inlet of the instrument (6.2.5), and to ensure gas tightness intact.

7.1.2

Preparation of batteries, to ensure adequate power.

7.1.3

Use high-purity nitrogen (5.1) to clean the gas line tube and instrument gas chamber.

7.1.4

Check the working status of the instrument to ensure that the light source intensity, the height of the interferogram, the temperature of the sample chamber and other parameters reach the test Seeking (reference instrument manual).

7.1.5

zero calibration with high purity nitrogen (5.1) instrument, save the background spectrum.

Infrared light source Interferometer Sample room Detector Signal Processing Electronic components

7.1.6

Calculate and set the sampling time reasonably based on the sampling pump flow rate and