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

HJ 646-2013

**Ambient air and stationary source emissions. Determination of
gas and particle-phase polycyclic aromatic hydrocarbons with
gas chromatography/mass spectrometry**

环境空气和废气 气相和颗粒物中多环芳烃的测定 气相色谱-质谱法

(English Translation)

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Table of Contents

Foreword	
1 Scope of application	
2 Normative references	
3 Terms and definitions	
3.1 Full program blank whole program blank	
3.2 Shipping Blank Trip Blank	
3.3 Internal standards	
3.4 Surrogate standards	
3.5 Sampling efficiency sampling efficiency	
3.6 Dynamic sampling efficiency	
4 Principle of the method	
5 Interference and elimination	
6 Reagents and materials	
6.5 Anhydrous sodium sulfate (Na ₂ SO ₄)	
6.7 Alternatives	
6.8 Internal standard solution	
6.9 Standard solution	
6.11 Eluent	
6.14 Ultra-fine glass fiber filter or quartz fiber filter	
6.15 Glass fiber filter cartridge (quartz filter cartridge)	
6.17 Polyurethane Foam (PUF)	
6.19 Glass wool	
7 Instruments and equipment	
7.2 Ambient air sampling equipment	
7.3 Fixed source exhaust sampling equipment	
8 Samples	
8.1 Sample Collection	
8.2 Preservation of samples	
8.3 Preparation of samples	

Foreword

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 Atmospheric Pollution this standard is formulated to ensure human health and to regulate the determination of polycyclic aromatic hydrocarbons in ambient air and exhaust gases.

This standard specifies gas chromatography-mass spectrometry for the determination of sixteen polycyclic aromatic hydrocarbons in ambient air and exhaust gases.

This standard is the first release.

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

This standard was formulated by the Science and Technology Standards Department of the Ministry of Environmental Protection.

This standard was drafted. Shenyang Environmental Monitoring Center Station, Environmental Standards Institute of the Ministry of Environmental Protection.

This standard is verified by. Jiangsu Environmental Monitoring Center, Liaoning Provincial Environmental Monitoring Experimental Center, and Dalian Environmental Monitoring Heart, Anshan Environmental Monitoring Center Station and Liaoning Provincial Academy of Environmental Sciences.

This standard was approved by the Ministry of Environmental Protection on June 3, 2013.

This standard has been implemented since September 1, 2013.

This standard is explained by the Ministry of Environmental Protection.

Determination of polycyclic aromatic hydrocarbons in gaseous and particulate gases from ambient air and exhaust gases Gas chromatography-mass spectrometry Warning. The solvents and reagents used in this method are both toxic and potentially hazardous to health and should be avoided as much as possible.

Direct contact with some chemicals. The sample preparation process should be carried out in a fume hood, and the reagents used and the analyzed samples should be recovered and carried out.

Safe handling.

1 Scope of application

This standard specifies gas chromatography-mass spectrometry for the determination of sixteen polycyclic aromatic hydrocarbons in ambient air and exhaust gases.

This standard applies to sixteen polycyclic aromatic hydrocarbons in gas phase and particulate matter in ambient air, fixed source exhaust and unorganized exhaust air.

Determination of (PAHs). Sixteen polycyclic aromatic hydrocarbons include naphthalene, terpenes, anthracene,, phenanthrene, anthracene, fluoranthene, anthracene, benzo(a)pyrene, benzene and (b) fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, anthracene (1,2,3-c,d), dibenzo(a,h), benzo (g,h,i). If verified this standard also applies to the determination of other polycyclic aromatic hydrocarbons.

When ambient air is collected at 100L/min for 24h, it is measured by full scan method. The detection limit of the method is 0.0004~ 0.0009 $\mu\text{g}/\text{m}^3$, the lower limit of determination is 0.0016~0.0036 $\mu\text{g}/\text{m}^3$; when the ambient air is collected at 225L/min for 24h, the full scan method is adopted.

Determination, the detection limit of the method is 0.0002 ~ 0.0004 $\mu\text{g}/\text{m}^3$, the lower limit of determination is 0.0008 ~ 0.0016 $\mu\text{g}/\text{m}^3$; when collecting fixed source exhaust at 1 m³, the detection limit was 0.05-0.12 $\mu\text{g}/\text{m}^3$ and the lower limit of determination was 0.20-0.48 $\mu\text{g}/\text{m}^3$. See details Schedule A.

2 Normative references

The contents of this standard refer to the terms in the following documents. 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/T 48 soot sampler technical conditions HJ/T 55 Technical Guidelines for the Monitoring of Unorganized Emissions of Air Pollutants HJ/T 93 PM10 sampler technical requirements and testing methods HJ/T 365 Hazardous Waste Incineration (including Medical Waste) Disposal Facilities Dioxin Emission Monitoring Technical Specifications

3 Terms and definitions

The following terms and definitions apply to this standard.

3.1 Full program blank whole program blank

The sealed storage cylinder and the glass fiber filter/cylinder are brought to the sampling site, and are exposed to the sampling site without sampling.

After sampling, the sample is shipped back to the laboratory, processed and measured in the same operating steps as the sample, for inspection from sample collection to analysis.

Whether the whole process is polluted.

3.2 Shipping Blank Trip Blank

The sealed sample cylinder and the glass fiber filter/cylinder are brought to the sampling site, and the sample is not opened during sampling, and the sample is returned to the experiment after sampling.

The chamber is processed and measured in the same operating steps as the sample to check whether the sample transport process is contaminated.

3.3 Internal standards

Compounds not contained in the sample are added to known amounts prior to sample analysis for quantitative analysis of the target compound.

3.4 Surrogate standards

A substance that is not contained in the sample but has similar physicochemical properties to the target compound to be tested. Usually added before sample extraction or sampling in, the recovery rate can be used to evaluate the effect of the sample preparation or sampling process on the analytical results.

3.5 Sampling efficiency sampling efficiency

Refers to the ability of the sampler to capture and retain polycyclic aromatic hydrocarbons. Add a certain amount of polycyclic aromatic hydrocarbons to the sampling filter, the same as the sample the operating conditions are pumped air to determine the retention capacity of the sample medium for polycyclic aromatic hydrocarbons.

3.6 Dynamic sampling efficiency

Add a certain amount of polycyclic aromatic hydrocarbons to the surface of the sampling adsorption column, pump air according to the same operating conditions as the sample, and determine the number of sampling media.

Retention capacity of cyclic aromatic hydrocarbons.

4 Principle of the method

Polycyclic aromatic hydrocarbons in gas phase and particulate matter are collected in sampling cylinders and glass (or quartz) fiber membranes/tubes, sampling cylinders and membranes.

10/90 (v/v) diethyl ether/n-hexane mixed solvent extraction, and the extract is purified by concentration, silica gel column or Florisil column.

Gas chromatography-mass spectrometry (GC/MS) detection was performed and