

ICS 13.040.20

CCS Z 11

HJ

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

HJ 647-2013

**Ambient air and stationary source emissions. Determination of
gas and particle-phase polycyclic aromatic hydrocarbons. High
performance liquid chromatography**

环境空气和废气 气相和颗粒物中多环芳烃的测定 高效液相色谱法

(English Translation)

Issued on: January 1, 1970

Implemented on: January 1, 1970

Issued by: Ministry of Ecology and Environment

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 Surrogate standards

3.4 Sampling efficiency

3.5 Dynamic sampling efficiency

4 Principle of the method

5 Interference and elimination

6 Reagents and materials

6.8 Standard solution

6.12 Eluent

6.13 Particulate matter sampling material

6.15 Polyurethane foam (PUF). polyether type, density 22 ~ 25mg/cm³, cutting growth
10mm ~ 20mm

7.3 Ambient air sampling equipment

7.4 Fixed source exhaust sampling equipment

8 Samples

8.1 Sample Collection

8.3 Sample preparation

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 high performance liquid chromatography 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 High performance liquid chromatography Warning. The solvents and reagents used in this method are all toxic and have potential hazards to health.

Avoid direct contact with these chemicals. Sample preparation should be carried out in a fume hood, reagents used and samples after analysis Need to be recycled and safely disposed of.

1 Scope of application

This standard specifies high performance liquid chromatography for the determination of sixteen polycyclic aromatic hydrocarbons in ambient air and exhaust gases.

This standard is applicable to more than 16 kinds of gas and particulate matter in ambient air, fixed source exhaust and unorganized exhaust air.

Determination of cyclic aromatic hydrocarbons. Sixteen polycyclic aromatic hydrocarbons (PAHs) include. naphthalene, terpenes, anthracene,, phenanthrene, anthracene, fluoranthene, anthracene, Benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene,benzo[a]pyrene,indole[1,2,3-c,d]indole, dibenzo[a,h]?, Benzo[g,h,i]?. This standard is also applicable to the determination of other polycyclic aromatic hydrocarbons.

When the ambient air is collected at 100L/min for 24h, the detection limit of the method is 0.04-0.26ng/m³, and the lower limit of determination is 0.16-1.04ng/m³; when collecting 1m³ of fixed source exhaust gas, the detection limit of the method is 0.01-0.04μg/m³, and

the lower limit of determination is 0.04-0.16 µg/m³. See Appendix A for details.

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

Bring the sealed sample cylinder and glass fiber filter/cylinder to the sampling site, and expose it to the sampling site without sampling.

Oversampling, sampled and shipped back to the laboratory, processed and measured in the same operating steps as the sample, used for inspection Whether the sample is collected and analyzed is contaminated.

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 sampled after sampling.

Returned to the laboratory, processed and measured in the same operating steps as the sample, used to check whether the sample transport process is contaminated dye.

3.3 Surrogate standards

Refers to a substance that is not contained in the sample but has similar physicochemical properties to the analyte. 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.

3.4 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, press and sample Air was drawn under the same operating conditions to determine the retention capacity of the sample medium for polycyclic aromatic hydrocarbons.

3.5 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 measure the sampling medium.

The ability to retain polycyclic aromatic hydrocarbons.

4 Principle of the method

Polycyclic aromatic hydrocarbons in gas phase and particulate matter are collected in sampling cylinder and glass (or quartz) fiber membrane/tube, sampling cylinder and filter/cartridge with 10/90 (v/v) ether/n-hexane mixed solvent extraction, the extract is concentrated, silica gel column or Flory After purification by a silica column or the like, it is separated and detected by a high performance liquid chromatograph with a fluorescent/ultraviolet detector.

5 Interference and elimination

Heating, ozone, nitrogen oxides, and ultraviolet light during sample collection, storage, and processing can cause degradation of polycyclic aromatic hydrocarbons.

Need to be sealed, low temperature, and protected from light.

6 Reagents and materials

Analytical purification reagents and distilled water in accordance with national standards were used for analysis unless otherwise stated.

6.1

Acetonitrile (CH_3CN). Pure by liquid chromatography.

6.2

Methanol (CH_3OH). Pure by liquid chromatography.

6.3

Dichloromethane (CH_2Cl_2). Chromatographically pure.