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HJ

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

HJ 1077-2019

**Stationary source emission--Determination of oil fume and oil
mist--Infrared spectrophotometric method
(English Translation)**

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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 this standard is formulated to ensure human health, regulate the measurement methods of oil smoke and oil mist in the exhaust gas from stationary sources.

This standard specifies the infrared spectrophotometric method for the determination of oil smoke and oil mist in the exhaust gas from stationary sources.

This standard is issued for the first time.

This standard is organized and formulated by the Ecological Environment Monitoring Department and the Regulations and Standards Department of the Ministry of Ecology and Environment.

1 Scope of application

This standard specifies the infrared spectrophotometric method for the determination of oil smoke and oil mist in the exhaust gas from stationary sources.

This standard is applicable to the determination of oil smoke and oil mist in the exhaust gas

of stationary pollution sources.

When the sampling volume is 250 L (standard state), the extraction volume is 25 ml, when using a 4 cm quartz cuvette, the Methods The detection limits of oil fume and oil mist were both 0.1 mg/m³, and the lower detection limits were 0.4 mg/m³.

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 18483 Catering industry smoke emission standards (for trial implementation) GB/T 16157 Determination of particulate matter in exhaust gas from stationary sources and sampling method of gaseous pollutants Technical condition of HJ/T 48 soot sampler HJ/T 397 Fixed source exhaust gas monitoring technical specification

3 Terms and definitions

The following terms and definitions apply to this standard.

Oil fume

Refers to the volatile oils and fats, organic matter, and their thermal decomposition or cracking products during food cooking and processing.

Oil mist

Refers to the mineral oil and its heating generated in the industrial production process (such as mechanical processing, heat treatment of metal materials, etc.) and its heating Decomposition or cracking products.

4 Method principle

The oil fume and oil mist in the waste gas from the fixed pollution source are adsorbed by the filter cartridge, and then ultrasonically extracted with tetrachloroethylene, and the extract is separated by infrared Photometric determination. The content of oil fume and oil mist is 2930 cm⁻¹ by wave number (the stretching vibration of CH bond in CH₂ group), 2960 cm⁻¹ (the stretching vibration of CH bond in CH₃ group) and 3030 cm⁻¹ (extension vibration of CH bond in aromatic ring) the absorbances A₂₉₃₀, A₂₉₆₀ and A₃₀₃₀ at the band are calculated.

5 Reagents and materials

Unless otherwise stated, analytical reagents that meet national standards are used for analysis.

5.1

n-hexadecane (C₁₆H₃₄).

5.2

Isooctane (C₈H₁₈).

5.3

Benzene (C₆H₆).

5.4

Tetrachloroethylene (C₂Cl₄).

Using a 4 cm cuvette and air cell as reference, the absorbance at wavenumbers of 2930 cm⁻¹, 2960 cm⁻¹ and 3030 cm⁻¹ should be Do not exceed 0.34, 0.07, and 0, respectively.

5.5

Anhydrous sodium sulfate (Na₂SO₄).

It was heated at 500 °C for 4 h, and after cooling, it was put into a ground glass bottle and placed in a desiccator.

5.6

Standard stock solution of n-hexadecane. $\rho \sim 1 \times 10^4$ mg/L.

Weigh a 100 ml empty volumetric flask (accurate to 1 mg), then add about 1 g of n-hexadecane (5.1), and weigh it again (quasi Make sure to 1 mg), add tetrachloroethylene (5.4) to volume, mix well, and calculate the exact concentration of n-hexadecane standard stock solution.

5.7

Standard use liquid of n-hexadecane. $\rho = 1.00 \times 10^3$ mg/L.

Pipette an appropriate amount of n-hexadecane standard stock solution (5.6) into a 100 ml volumetric flask and make up to volume with tetrachloroethylene (5.4).

Mix well.

5.8

Standard stock solution of isooctane. $\rho \sim 1 \times 10^4$ mg/L.

Weigh a 100 ml empty volumetric flask (accurate to 1 mg), then add about 1 g of isooctane (5.2), and weigh again (precise Make sure to 1 mg), add tetrachloroethylene (5.4) to the volume, mix well, and calculate the exact concentration of the standard stock solution of isooctane.

5.9

Standard use solution of isooctane. $\rho = 1.00 \times 10^3 \text{ mg/L}$.

Pipette an appropriate amount of the standard stock solution of isooctane (5.8) into a 100 ml volumetric flask, make a volume with tetrachloroethylene (5.4) uniform.

5.10

Standard stock solution of benzene. $\rho \sim 1 \times 10^4 \text{ mg/L}$.

Weigh a 100 ml empty volumetric flask (accurate to 1 mg), then add about 1 g of benzene (5.3), weigh again (accurate to 1 mg), add tetrachloroethylene (5.4) to the volume, mix well, and calculate the exact concentration of benzene standard stock solution.

5.11

Standard use solution of benzene. $\rho = 1.00 \times 10^3 \text{ mg/L}$.

Pipette an appropriate amount of benzene standard stock solution (5.10) into a 100 ml volumetric flask, make up to volume with tetrachloroethylene (5.4), and mix.

Note: The commercially available certified standard solution can be purchased directly.

5.12

Standard fume oil.

Add 300 ml of peanut oil to a 500 ml double-necked decanter, insert a thermometer with a range of 500°C at the side port, at 120°C Heat at an open temperature for 30 min, then install an air condensing tube at the upper mouth, raise the temperature to 300°C , and reflux for 2 h, then the standard After cooling, take an appropriate amount and place it in a 500 ml sample vial with a Teflon lined screw cap.

5.13

Standard oil stock solution of fume. $\rho \sim 1 \times 10^4 \text{ mg/L}$.

Weigh a 100 ml empty volumetric flask (accurate to 1 mg), then add about 1 g of fume standard oil (5.12), and weigh again (Accurate to 1 mg), add tetrachloroethylene (5.4) to the mark, mix well, and calculate the exact concentration of the stock oil of standard oil fume.

5.14

Use liquid for standard oil of fume. $\rho = 100 \text{ mg/L}$.

Pipette a proper amount of stock oil standard oil stock solution (5.13) into a 250 ml volumetric flask and dilute with tetrachloroethylene (5.4) to Marking.

5.15

Oil mist standard oil.

Pipette 6.5 ml n-hexadecane (5.1), 2.5 ml isooctane (5.2) and 1.0 ml benzene (5.3) with a