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

HJ 643-2013

**Solid waste. Determination of volatile organic compounds.
Headspace-gas chromatography/mass method**

固体废物 挥发性有机物的测定 顶空 气相色谱—质谱法

(English Translation)

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5.3 Sodium chloride (NaCl). excellent grade pure

5.7 Sodium hydroxide solution. $c(\text{NaOH}) = 1 \text{ mol/L}$

5.8 Extractant

5.9 Matrix modifier

5.10 Standard stock solution. $\rho = 1000 \text{ mg/L} \sim 5000 \text{ mg/L}$

5.12 Internal standard solution. $\rho = 250 \text{ mg/L}$

5.13 Alternative standard solution. $\rho = 250 \text{ mg/L}$

6 Instruments and equipment

6.4 Headspace Sampler. with headspace bottle, gasket (PTFE/silicone or PTFE/butyl rubber), cap

6.5 Zero-Headspace Extraction Vessel. 500-600 ml for leaching in the sample

6.6 Flip-type oscillator. speed is $30 \pm 2 \text{ r/min}$

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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 Environmental Pollution by Solid Waste this standard is formulated to protect the environment, protect human health, and regulate the determination of volatile organic compounds in solid waste.

This standard specifies headspace/gas chromatography-mass spectrometry for the determination of volatile organic compounds in solid waste.

This standard is the first release.

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

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

This standard is mainly drafted by. Anshan Environmental Monitoring Center Station, Environmental Protection Institute of the Ministry of Environmental Protection.

This standard is verified by. Liaoning Provincial Environmental Monitoring Experimental Center, Shenyang Environmental Monitoring Center Station, Dalian Environmental Monitoring Center, Harbin Environmental Monitoring Center Station, Fushun Environmental Monitoring Center Station and Liaoyang Environmental Monitoring Center Station.

This standard was approved by the Ministry of Environmental Protection on January 21, 2013.

This standard has been implemented since July 1, 2013.

This standard is explained by the Ministry of Environmental Protection.

Determination of volatile organic compounds in solid wastes by headspace/gas chromatography-mass spectrometry Warning. The internal standard, substitute and standard solution used in the test are volatile toxic compounds. The preparation process should be Operation in the fume hood; the sample preparation process should fully consider whether it is toxic or hazardous solid waste;

Wear protective gear to avoid contact with skin and clothing.

1 Scope of application

This standard specifies headspace/gas chromatography-mass spectrometry for the determination of volatile organic compounds in solid waste.

This standard applies to the determination of 36 volatile organic compounds in solid waste and solid waste leachate. If you pass the verification the standard is also applicable to the determination of other volatile organic compounds.

When the amount of solid waste sample is 2 g, the detection limit of 36 target compounds is 0.8 µg/kg~4 µg/kg.

Limit 4 µg/kg ~15 µg/kg. When the volume of solid waste leachate is 10 ml, the detection limit of 36 target compounds is 0.1.

Gg/L~0.3 µg/L, the lower limit of measurement is 0.4 µg/L~2 µg/L. See Appendix A for details.

2 Normative references

The contents of this standard refer to the following documents or their terms. For undated references, the valid version is appropriate.

Used in this standard.

HJ/T 20 Technical Specifications for Sampling and Sample Preparation of Industrial Solid Waste
HJ/T 299 solid waste leaching toxicity leaching method sulfuric acid nitric acid method
HJ/T 300 solid waste leaching toxicity leaching method acetic acid buffer solution method

3 Terms and definitions

The following terms and definitions apply to this standard.

3.1 Internal standards

Refers to a substance that is not contained in the sample but has similar physicochemical properties to the target to be tested. Usually added before sample analysis in, for the quantification of the target.

3.2 Surrogate standards

Refers to a substance that is not contained in the sample but has similar physicochemical properties to the target to be tested. Generally in sample extraction or other Before the pretreatment, the recovery rate can be used to evaluate the influence of the sample matrix and the sample processing process on the analysis results.

3.3 Matrix spiked spike

Refers to the addition of a known amount of the target to be tested to the sample. It is used to evaluate the recovery of the target and the matrix effect of the sample.

3.4 Calibration verification standards

Refers to a standard solution with a concentration near the midpoint of the calibration curve to confirm the validity of the calibration curve.

3.5 Shipping Blank Trip Blank

10 ml matrix modifier and 2.0 g quartz sand were placed in the headspace bottle for sealing before sampling, taking them to the sample on site. When the sample is not opened, it will be shipped back to the laboratory with the sample, and the experiment will be carried out according to the same analysis steps as the sample.

Check if the sample is contaminated during transportation.

3.6 Full program blank whole program blank

10 ml matrix modifier and 2.0 g quartz sand were placed in the headspace bottle for sealing before sampling, taking them to the sample on site. Simultaneously open and seal with the sample vial, then transport it back to the laboratory with the sample, following the same analytical steps as the sample an experiment is performed to check whether the entire process from sample collection to analysis is contaminated.

4 Principle of the method

Under certain temperature conditions, the volatile components in the sample in the headspace bottle volatilize into the liquid space to generate vapor pressure.

The liquid-solid three-phase reaches the thermodynamic dynamic equilibrium. The volatile organic compounds in the gas phase are separated by gas chromatography and then mass spectrometer Detection. Qualitative by comparison with standard material retention times and mass spectra, quantified by internal standard method.

5 Reagents and materials

Unless otherwise stated, chromatographically pure reagents that meet national standards were used for the analysis.

5.1

Experimental water. double distilled water or water prepared by pure water equipment. Need to pass the blank test before use, confirm no interference peaks appeared in the