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HJ

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

HJ 605-2011

**Soil and Sediment. Determination of Volatile Organic
compounds. Purge and Trap Gas Chromatography/Mass
Spectrometry Method
(English Translation)**

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Foreword

In order to implement the Environmental Protection Law of the People's Republic of China, protect the environment, protect human health, and regulate the volatility of soil and sediment.

This standard is established for the measurement method of the machine.

This standard specifies the purge and trap/gas chromatography-mass spectrometry for the determination of volatile organic compounds in soils and sediments.

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. Dalian Environmental Monitoring Center.

This standard is verified by. Liaoning Provincial Environmental Monitoring Experimental

Center, Anshan Environmental Monitoring Center Station, Jiangsu Environmental Monitoring Center, Shanghai Municipal Environmental Monitoring Center and Henan Environmental Monitoring Center Station.

This standard was approved by the Ministry of Environmental Protection on February 10, 2011.

This standard has been implemented since June 1, 2011.

This standard is explained by the Ministry of Environmental Protection.

Determination of volatile organic compounds in soils and sediments Purge and trap/gas chromatography-mass spectrometry Warning. The internal standard, substitutes and standard samples used in the experiment are volatile toxic chemicals, and the solution should be prepared in a fume hood.

In the operation, the protective equipment should be worn as required to avoid contact with skin and clothing.

1 Scope of application

This standard specifies the purge and trap/gas chromatography-mass spectrometry for the determination of volatile organic compounds in soils and sediments.

This standard applies to the determination of 65 volatile organic compounds in soils and sediments. If verified by this standard, it can also be applied to other volatilization.

Determination of sex organic matter.

When the sample amount is 5 g and the full-scan analysis is performed by standard quadrupole mass spectrometry, the detection limit of the target is 0.2-3.2 µg/kg.

The lower limit is 0.8 to 12.8 µg/kg. 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 17378.3 Marine monitoring specification Part 3. Sample collection, storage and transport HJ/T 166 Technical Specifications for Soil Environmental Monitoring

3 Terms and definitions

The following terms and definitions apply to this standard.

Internal standard

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, for mesh Quantitative analysis of the standard.

Surrogate

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

Matrix spiked spike

It means that a known amount of the target to be tested is added to the sample for evaluating the recovery rate of the target and the matrix effect of the sample.

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.

Transport blank strip blank A blank reagent water is placed in the sample vial in the laboratory prior to sampling and brought to the sampling site. Do not open when sampling, then follow the sample is shipped back to the laboratory and tested in the same operating steps as the sample to check for contamination during transport.

Full program blank whole program blank A blank reagent water is placed in the sample vial in the laboratory prior to sampling and brought to the sampling site. Simultaneously with the sample vial Cover and seal, then transport it back to the laboratory with the sample, and test it in the same way as the sample, for inspection from sample collection to analysis Whether the process is contaminated.

4 Principle of the method

The volatile organic compounds in the sample are enriched in the trap tube by high-purity helium (or nitrogen) purge, and the trap tube is heated and reversed with high purity helium gas.

The components which are blown and thermally desorbed enter the gas chromatograph and are separated, and then detected by a mass spectrometer. By comparing with the standard mass spectrum of the target to be tested the comparison and retention time were qualitative and the internal standard method was used for quantification.

5 Reagents and materials

5.1

Blank reagent water. double distilled water or water prepared by pure water equipment.

A blank test is required before use to confirm that there is no interference peak in the

retention time interval of the target or that the target substance is rich.

The degree is below the method detection limit.

5.2

Methanol (CH₃OH). Analytical grade of pesticide residues.

5.3

Standard stock solution. $\rho = 1\,000 \sim 5\,000$ mg/L.

Commercially available certified standard solutions can be purchased directly or formulated with standard materials.

5.4

Standard use solution. $\rho = 10.0 \sim 100.0$ mg/L.

Standard use of volatile targets such as dichlorodifluoromethane, methyl chloride, trichlorofluoromethane, ethyl chloride, methyl bromide and vinyl chloride Prepared separately, the shelf life is usually one week, the standard use of other target materials is one month, or according to the manufacturer's instructions.

5.5

Internal standard solution. $\rho = 25$ µg/ml.

Fluorobenzene, chlorobenzene-D₅ and 1,4-dichlorobenzene-D₄ should be used as internal standards. Can be purchased directly from commercially available certified standard solutions, or with high quality Formulated in a standard solution.

5.6

Alternative standard solution. $\rho = 25$ µg/ml.

Dibromofluoromethane, toluene-D₈ and 4-bromofluorobenzene should be used as alternatives. Can be purchased directly from commercially available certified standard solutions, or with high quality Formulated in a concentration standard solution.

5.7 4-bromofluorobenzene (BFB) solution. $\rho = 25$ µg/ml.

It can be purchased directly from a commercially available certified standard solution or prepared with a high quality standard solution.

5.8

Helium. Purity (volume fraction) is 99.999% or more.

5.9

Nitrogen. Purity (volume fraction) is 99.999% or more.

Note: All the above standard solutions are treated with methanol as solvent, stored at 4 ° C or less in the dark or with reference to the manufacturer's product description. Should be restored to before