

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

HJ 911-2017

**Soil and sediment--Extraction of organic
compounds--Ultrasonic extraction**

土壤和沉积物 有机物的提取 超声波萃取法

(English Translation)

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Foreword

In order to carry out "Environmental Protection Law of the People's Republic of China", protect the environment, protect human health, regulate soil and sediment in the extraction of organic matter, the development of this standard.

This standard specifies the extraction of organic matter in soil and sediment by ultrasonic extraction.

This standard Appendix A and Appendix B is an informative annex.

This standard is released for the first time.

This standard by the Environmental Protection Department of Environmental Monitoring Division and Science and Technology Standards Division to develop.

This standard was drafted. Shanghai Environmental Monitoring Center.

This standard MEP approved on December 29, 2017.

This standard since April 1, 2018 come into operation.

This standard is interpreted by the MEP.

Soil and sediment extraction of organic matter by ultrasonic extraction Warning. The organic

solvents and standard solutions used in the experiment are toxic and hazardous substances, should be operated in a fume hood, and press Provisions on wearing protective equipment, to avoid contact with skin and clothing.

1 Scope of application

This standard specifies the extraction of organic matter in soil and sediment by ultrasonic extraction.

This standard applies to soil and sediment polycyclic aromatic hydrocarbons, phenols, phthalates and organochlorine pesticides and other semi-volatile for the extraction of sexual organics, the reference list of organics that can be extracted by this method is shown in Appendix A. If verified, other organic matter also this method can be used to extract.

This standard does not apply to the extraction of volatile organic substances (such as organophosphorus pesticides, etc.) extraction conditions.

2 Normative references

This standard references the following documents or the terms. For undated references, the effective version applies to this book standard.

GB 17378.3 Marine monitoring code - Part 3. Sample collection, storage and transport GB 17378.5 Marine monitoring code - Part 5. Sediment analysis HJ 613 Determination of soil dry matter and moisture Gravimetric method HJ/T 166 Soil Environmental Monitoring Technical Specifications

3 Method principle

Utilizing the mechanical vibration effect, cavitation effect and perturbation effect caused by ultrasonic radiation, Adsorption on the surface of sediments increases the frequency and speed of movement of matter molecules, increases the penetration of solvents, and accelerates organic matter Dissolution in the organic phase.

4 Reagents and materials

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

4.1

extractant.

4.1.1

Dichloromethane (CH₂Cl₂).

4.1.2

n-Hexane (C₆H₁₄).

4.1.3

Acetone (C₃H₆O).

4.1.4

Dichloromethane - acetone mixed solvent. 1 1.

Mix with dichloromethane (4.1.1) and acetone (4.1.3) at a volume ratio of 1.1.

4.1.5

n-hexane - acetone mixed solvent. 1 1.

Mix with n-hexane (4.1.2) and acetone (4.1.3) at a volume ratio of 1.1.

Note: According to the determination of the target compound extractant can use dichloromethane (4.1.1), n-hexane (4.1.2), dichloromethane - acetone mixed solvent (4.1.4) or n-hexane-acetone mixed solvent (4.1.5) (see Appendix B). If verified, other solvents are acceptable as the method of extracting agent.

4.2

anhydrous sodium sulfate (Na₂SO₄). granular.

Burning at 400 °C 4 h above, cooled and transferred to glass bottles, sealed and stored in a dry dish.

4.3

quartz glass wool.

Ignition at 400 °C 1 h above, cooled and placed in a sealed glass jar sealed.

5 Instruments and equipment

5.1

Sample ultrasonic extraction instrument. probe type, the power is not less than 500 W, the ultrasonic output power can be adjusted.

5.2

Centrifuge. 2 000 r/min or above.

5.3

oven. temperature can be controlled at (105 ± 5) °C.

5.4

Sampling bottles. brown capping large mouth glass bottles, PTFE cap with a pad.

5.5

General laboratory equipment and equipment.

6.1 Sample Collection and Storage

Soil samples were collected and stored according to HJ/T 166. In accordance with the relevant provisions of GB 17378.3 into Sediment sample collection and preservation.

6.2 Sample Preparation

6.2.1

Place the soil sample on a stainless steel plate, remove the sticks, leaves, stones, glass, scrap metal and other foreign matter, mix well Samples; sediment samples to remove the surface of the water sample layer, and then remove sticks, leaves, stones, glass, scrap metal and other foreign matter, Mix samples. Then follow the HJ/T 166 requirements for sample fractionation.

If the analytical method is otherwise specified, it shall be implemented according to the provisions.

6.2.2

When extracting fresh samples, weigh approximately 20 g (to 0.01 g) of the sample in a 250 ml glass beaker and add a Quantitative anhydrous sodium sulfate (4.2) (anhydrous sodium sulfate added depending on the amount of moisture content of the sample, but to ensure that the total is not super Half the capacity of the beaker), stir with a stainless steel spoon, so that the sample after stirring flow sand, to be extracted.

Note 1: Freeze-drying method can also be used.

Note 2: All samples should not be oven dried.

6.3 Determination of moisture content

The moisture content was measured at the same time as the samples were taken. Soil samples were dried according to HJ 613 Determination, in accordance with the requirements of GB 17378.5 Determination of moisture content of sediment samples.

7 Extraction steps

7.1

Add about 50 ml of extractant (4.1) to the beaker containing the sample (6.2.2) to ensure that the level of extractant added is high the surface of the solid sample is about 2 cm, and