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

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**Soil and sediment. Determination of volatile aromatic
hydrocarbons. Headspace gas chromatography**

土壤和沉积物 挥发性芳香烃的测定 顶空气相色谱法

(English Translation)

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Table of Contents

Foreword

1 Scope of application

2 Normative reference documents

3 Principle of the method

4 Reagents and materials

5 Instruments and equipment

6 Samples

6.1 Collection and storage of samples

6.2 Preparation of the sample

6.3 Preparation of blank samples

7 Analysis steps

7.1 Instrument reference conditions

Foreword

To implement the Environmental Protection Law of the People's Republic of China, protect the environment, protect human health, regulate soil and sediment in the determination of volatile aromatic hydrocarbons, the development of this standard.

This standard specifies headspace/gas chromatography for the determination of volatile aromatic hydrocarbons in soil and sediments.

This standard is the first release.

Appendix A of this standard is a normative appendix, Appendix B is an informative appendix.

This standard is organized by the Ministry of Environmental Protection Science and Technology Standards Division.

The main drafting unit of this standard. Anshan City Environmental Monitoring Center Station.

The standard verification unit. Liaoning Province Environmental Monitoring Experimental Center, Shenyang City Environmental Monitoring Center Station, Dalian City Environmental Monitoring Center, Harbin Environmental Monitoring Center, Fushun City Environmental Monitoring Center Station and Liaoyang City Environmental Monitoring Center Station.

The environmental protection department of this standard approved on May 4, 2015.

This standard has been implemented since July 1, 2015.

This standard is explained by the Ministry of Environmental Protection.

Determination of Volatile Aromatic Hydrocarbons in Soil and Sediment Headspace/Gas Chromatography WARNING. The reagents and standard solutions used in the test are volatile, and the preparation process should be carried out in a fume hood to operate; should be required to wear protective equipment, to avoid contact with skin and clothing.

1 Scope of application

This standard specifies the headspace/gas chromatographic method for the determination of 12 volatile aromatic hydrocarbons in soil and sediments.

This standard applies to the determination of 12 volatile aromatic hydrocarbons in soil and sediments. Other volatile aromatic hydrocarbons if passed the certificate also applies to this standard.

When the sampling amount is 2 g, the detection limit of 12 kinds of volatile aromatic hydrocarbons is 3.0 ~ 4.7 µg/kg, the lower limit is 12.0 ~ 18.8 µg/kg, see Appendix A.

2 Normative reference documents

The contents of this standard refer to the following documents or their terms. Those who do not specify the date of the reference file, the effective version of the appropriate for this standard.

GB 17378.3 Marine Monitoring Specification Part 3 Sample Collection Storage and Transportation GB 17378.5 Marine monitoring regulations Part 5 Sediment analysis Determination of Dry Matter and Moisture in Soil Technical specification for soil environmental monitoring

3 Principle of the method

At a certain temperature, the volatiles of volatile aromatic hydrocarbons in the headspace bottle evaporate to the liquid space, and the gas-liquid three-phase reaches the heat Mechanically dynamic equilibrium. The volatile aromatic hydrocarbons in the gas phase are separated by gas chromatography and detected by flame ionization detector. To protect Time qualitative, external standard method.

4 Reagents and materials

4.1

Experimental water. secondary distilled water or water prepared by ultrapure water preparation. Before use to be blank test test, indeed There was no interference with the

peaks in the retention time interval of the target.

4.2

Methanol (CH₃OH). Pesticide level or equivalent level. By blank test, it was confirmed that there was no retention time in the target There are interference peaks appear.

4.3

sodium chloride (NaCl). excellent grade pure.

In a muffle furnace (or box-type electric furnace) at 400 °C baking 4 h, placed in a dryer to cool to room temperature, transferred to the grinding glass Keep in the bottle.

4.4

phosphoric acid (H₃PO₄). excellent grade pure.

4.5

saturated sodium chloride solution.

Measure the amount of 500 ml of experimental water (4.1), add a few drops of phosphoric acid (4.4) to adjust to pH ≤ 2, add 180 g of sodium chloride (4.3) Dissolve and mix. At 4 °C under the dark preservation, can be stored for 6 months.

4.6

Standard stock solution. ρ = 1000 μg/ml.

2 volatile aromatic hydrocarbon methanol standard solution can be purchased directly to prove the standard solution can also be prepared with standard materials. Including benzene, Toluene, ethylbenzene, m-xylene, p-xylene, o-xylene, cumene, styrene, chlorobenzene, 1,3-dichlorobenzene, 1,4-Dichlorobenzene, 1,2-dichlorobenzene.

Store at or below 4 ° C or refer to the manufacturer's product description. Before use should be restored to room temperature, and shake. After opening Freeze sealed for up to 14 days. Such as the purchase of high concentrations of standard stock solution, the use of methanol (4.2) for appropriate dilution.

4.7

quartz sand (SiO₂). analytical grade, 20 mesh to 50 mesh.

Before use, verify that the target compound or target compound concentration is below the method detection limit.

4.8

Carrier gas. high purity nitrogen (>=99.999%), deoxidized by deoxidizer, dehydrated by molecular sieve.

4.9

Gas. high purity hydrogen ($\geq 99.999\%$), dehydrated by molecular sieve.

4.10

to help gas. air, dehydrated by silica gel, activated carbon off organic matter.

5 Instruments and equipment

5.1

Gas Chromatograph. With split/splitless inlet, programmable temperature rise, with flame ionization detector (FID).

5.2

Column. quartz capillary column, 30 m (length) x 0.32 mm (inner diameter) x 0.25 μm (film thickness), the stationary phase is poly Diol. Other equivalent capillary columns may also be used.

5.3

Automatic headspace sampler. with headspace bottle (22 ml), gasket (polytetrafluoroethylene/silicone), cap (screw cap or one Times the use of the gland).

5.4

reciprocating oscillator. oscillation frequency of 150 times/min, can be fixed head empty bottle.

5.5

Balance. A balance of 0.01 g.

5.6

Microinjector. 5 μl , 10 μl , 25 μl , 100 μl , 500 μl , 1000 μl .

5.7

Sampling equipment. shovel and stainless steel spoon.

5.8

portable refrigerated containers. volume 20 L, the temperature below 4 $^{\circ}\text{C}$.

5.9

brown dense bottle. 2 ml, with PTFE packing and solid screw cap.

5.10

Sampling Bottle. 60 ml or 200ml threaded brown jar with a Teflon-Silica Tape Screw Cap.