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

HJ 893-2017

**Water quality. Determination of volatile petroleum
hydrocarbons(C6-C9). Purge and trap/gas chromatography**

水质 挥发性石油烃（C6-C9）的测定 吹扫捕集气相色谱法

(English Translation)

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Foreword

In order to implement the "Law of the People's Republic of China on Environmental Protection" and the "Law of the People's Republic of China on Prevention and Control of Water Pollution", protect the environment, Protection of human health, standardize the determination of volatile petroleum hydrocarbons (C6-C9), the development of this standard.

This standard specifies the purge trap/gas chromatography for the determination of volatile petroleum hydrocarbons (C6-C9) in water.

Appendix A of this standard 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 verification unit. Jiangsu Provincial Environmental Monitoring Center, Ministry of Industry and Information Technology Institute of the Fifth Electronics, Ningbo City Environment Monitoring Center, Changde Environmental Monitoring Station, Shanghai Chemical Environmental Monitoring Station and Shanghai Qingpu Environmental Monitoring Station.

This standard MEP approved on December 21, 2017.

This standard since February 1, 2018 implementation.

This standard is interpreted by the MEP.

1 Water quality Determination of volatile petroleum hydrocarbons (C6-C9)

Purge trap/gas chromatography Warning. The methanol solvent used in the experiment and the standard samples are toxic and hazardous compounds, the solution should be formulated in the pass Fume hood, the operation should be worn protective equipment, avoid contact with skin and clothing.

1 scope of application this standard specifies the purge trap/gas chromatography for the determination of volatile petroleum hydrocarbons (C6-C9) in water.

This standard applies to surface water, groundwater, seawater, sewage and industrial wastewater volatile petroleum hydrocarbons (C6-C9) the determination.

When the sample volume is 10.0 ml, the detection limit of the volatile petroleum hydrocarbon (C6-C9) method of this standard is 0.02 mg/L, the lower limit of determination is 0.08 mg/L.

When the sample volume is 20.0 ml, the detection limit of the volatile petroleum hydrocarbon (C6-C9) method of this standard is 0.01 mg/L, the lower limit of determination is 0.04 mg/L.

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 HJ/T 91 Technical Specifications for Surface Water and Sewerage Monitoring HJ/T 164 Groundwater Environmental Monitoring Technical Specifications

3 Terms and definitions

Volatile petroleum hydrocarbons (C6-C9) volatile petroleum hydrocarbons Under the conditions specified in this standard, the gas chromatogram retention time between 2-methylpentane (including) and n-C₁₀H₂₂ (Not included) between the material.

Note: The definition of volatile petroleum hydrocarbons (C6-C9) include aliphatic hydrocarbons, alicyclic hydrocarbons, aromatic or alkylated aromatic hydrocarbons and so on.

4 Method principle

The target compound in the sample is purged by high-purity nitrogen and adsorbed in a collecting pipe. The collecting pipe is heated and purged with high-purity nitrogen the components which were blown and desorbed were separated by gas chromatography and

detected by hydrogen flame ionization detector (FID) Retention time window qualitative, external standard method.

25 Reagents and materials

Unless otherwise specified, the analysis of the use of analytical reagents in line with national standards (experimental water for the newly prepared distilled water or deionized water).

5.1 methanol (CH_3OH). excellent grade pure.

5.2 Phosphoric acid. $\rho(\text{H}_3\text{PO}_4) = 1.87 \text{ g/ml}$.

5.3 phosphoric acid solution. 1 g.

5.4 Ascorbic acid ($\text{C}_6\text{H}_8\text{O}_6$).

5.5 Volatile petroleum hydrocarbon standard stock solution. $\rho(\text{C}_6\text{-C}_9) = 5000 \text{ mg/L}$.

You can buy a certified gasoline standard solution.

5.6 Volatile petroleum hydrocarbon standard solution. $\rho(\text{C}_6\text{-C}_9) = 1250 \text{ mg/L}$.

Add 3.00 ml methanol (5.1) to a 4 ml brown bottle, add 1.00 ml standard stock solution (5.5), and mix well. dense Seal frozen preservation, save for three months.

5.7 Alternative standard solution. $\rho = 500 \text{ mg/L}$.

Use 4-Bromofluorobenzene (BFB) as an alternative, you can buy a certified standard solution can also be used with high concentrations of standard material system.

5.8 2-methylpentane standard solution. $\rho(\text{C}_6\text{H}_{14}) = 5000 \text{ mg/L}$.

You can buy a certified standard solution.

5.9 n-Decane standard solution. $\rho(\text{C}_{10}\text{H}_{22}) = 5000 \text{ mg/L}$.

You can buy a certified standard solution.

5.10 Nitrogen. Purity 99.999%.

5.11 Hydrogen. Purity 99.99%.

5.12 Air. Decolorized silica gel in addition to water and hydrocarbon pipe to remove the hydrocarbon air, or by 5 E zeolite clean oil-free air.

Note: All of the above organic standard solution, the solvent is methanol. Should be cryopreserved, or according to the certificate to save. Should be returned to room temperature before use, Mix well.

6 instruments and equipment

6.1 Gas Chromatograph. Split/Splitless Inlet, Temperature Programmable, Flame Ionization Detector (FID) Workstations can achieve a certain time range of peak area plus function.

6.2 Purge and Trap. With a 25 ml purge, 100% Tenax adsorbent is used for the trap.

6.3 Column. Quartz capillary column, 30 m x 0.53 mm, thickness 3.0 μm (6% cyanopropyl phenyl - 94% dimethylsiloxane).

6.4 Vials. 40 ml brown glass bottle with silicone rubber - Teflon-lined screw cap.

6.5 Micro syringe. 10 μl , 100 μl , 1000 μl .

6.6 Hermetic syringe. 25 ml (purge trap exclusively for manual injection).

6.7 common laboratory equipment.

37 Samples

7.1 Sample Collection Sample collection according to HJ/T 91, HJ/T 164 and GB 17378.3 of the relevant provisions. Before sampling, you need to join 0.3 g Ascorbic acid (5.4) in the sample vial (6.4); when collecting the sample, allow the water sample to overflow in the vial without air bubbles Add a few drops of phosphoric acid solution (5.3) so that the sample pH ≤ 2 , tighten the cap, labeling. Parallel pairs should be collected for each sample Sample, each batch of samples should be at least one full program blank.

7.2 Sample Storage

The collected samples immediately placed at 4 °C dark storage, within 3 d to complete the analysis. There should be no sample storage area Machine interference.

7.3 full program blank Add 0.3 g of ascorbic acid (5.4) with the same sample vial (6.4) to the sampling site, with the same batch in the field Check the water filled vials, add a few drops of phosphoric acid solution (5.3), so that pH ≤ 2 , tighten the cap, together with the sample back to the real Laboratory.

8 Analysis steps

8.1 Instrument reference conditions 8.1.1 purge and trap reference conditions Purge temperature. 35 °C; Purge time. 11 min; Purge flow rate. 30 ml/min; Desorption time. 0.5 min; Desorption Temperature. 190 °C. Other parameters refer to the instrument manual.

8.1.2 GC reference conditions Inlet temperature..200 °C; Injection mode. splitless injection.

Column temperature. the initial temperature of 38 °C (for 1 min), at a rate of 3.8 °C per minute rose to 80 °C for 1 min, each Min at a rate of 10 °C to 105 °C for 5 min and then at a rate of 10 °C per minute to 150 °C for 1 min the temperature was raised to 180 °C at a rate of 10 °C per minute for 5 minutes. The column flow was nitrogen (5.10). 8.0 ml/min.

Detector. temperature 250 °C; hydrogen (5.11). 30 ml/min; air (5.12). 300 ml/min.

8.2 Calibration

8.2.1 Determination of retention time window of volatile petroleum hydrocarbon (C6-C9)