

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

HJ 970-2018

**Water quality - Determination of petroleum - Ultraviolet
spectrophotometric method**

水质 石油类的测定 紫外分光光度法（试行）

(English Translation)

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Foreword

To implement the Law of the People's Republic of China on Environmental Protection, the Law of the People's Republic of China on the Prevention and Control of Water Pollution and the Chinese People the Marine Environmental Protection Law of the Republic protects the ecological environment, safeguards human health, and regulates the determination methods of petroleum in the water.

Set this standard.

This standard specifies the UV spectrophotometric method for the determination of petroleum in water.

This standard is the first release.

This standard is formulated by the Department of Eco-Environmental Monitoring, the Department of Regulation and Standards of the Ministry of Ecology and Environment.

This standard is mainly drafted by. Tianjin Ecological Environment Monitoring Center and China Academy of Environmental Sciences.

This standard is verified by. Hainan Environmental Monitoring Center Station, Guangxi Zhuang Autonomous Region Marine Environmental Monitoring Center Station, Zhejiang Zhoushan Marine Ecological Environment Monitoring Station, Qinhuangdao Environmental Monitoring Center of Hebei Province, and National Oceanic Administration Tianjin Seawater Desalination and Integration the Institute, Beijing Hua Testing Technology Co., Ltd.

This standard is approved by the Ministry of Ecology and Environment on October 10, 2018.

This standard has been implemented since January 1, 2019.

This standard is explained by the Ministry of Ecology and Environment.

1 Determination of water quality - Petroleum spectrophotometry

Warning. The n-hexane used in the experiment is toxic and should be handled in a fume hood while being worn as required.

Protective equipment to avoid contact with skin and clothing.

1 Scope of application this standard specifies the UV spectrophotometric method for the determination of petroleum in water.

This standard applies to the determination of petroleum in surface water, groundwater and seawater.

When the sample volume is 500 ml and the volume of the extract is 25 ml, the detection

limit of the method is 2 cm quartz cuvette.

0.01 mg/L, the lower limit of determination is 0.04 mg/L.

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.

GB 17378.3 Marine monitoring specification Part 3. Sample collection, storage and transport HJ 493 Technical Regulations for Preservation and Management of Water Quality Samples HJ/T 91 Surface Water and Wastewater Monitoring Technical Specifications HJ/T 164 Technical Specifications for Groundwater Environmental Monitoring

3 Principle of the method

Under the condition of $\text{pH} \leq 2$, the oil in the sample is extracted by n-hexane, and the extract is dehydrated by anhydrous sodium sulfate.

After removing the polar substances such as animal and vegetable oils by magnesium silicate, the absorbance is measured at a wavelength of 225 nm, and the petroleum content and absorption are measured.

The luminosity value is in accordance with Lambert-Beer's law.

4 Interference and elimination

After the extract is adsorbed by magnesium silicate, the interference of polar substances can be eliminated.

5 Reagents and materials

Unless otherwise stated, analytically pure reagents in accordance with national standards were used for the analysis, and the experimental water was distilled water or deionized water.

5.1

Hydrochloric acid. $\rho(\text{HCl}) = 1.19 \text{ g/ml}$.

5.2

Sulfuric acid. $\rho(\text{H}_2\text{SO}_4) = 1.84 \text{ g/ml}$.

5.3

n-Hexane (C_6H_{14}).

2 Before use, at a wavelength of 225 nm, use water as a reference to measure the light transmittance, and the light transmittance is greater than 90% before use.

Dearomatization treatment. Dearomatization method. Add 500 ml of n-hexane to a 1 000 ml separatory funnel (6.3) and add 25 ml.

The sulfuric acid (5.2) is washed for 10 min, the sulfuric acid phase is discarded, and the above operation is repeated until the sulfuric acid is nearly colorless, and then extracted with distilled water.

Wash 3 times until the light transmittance is greater than 90%.

5.4

Anhydrous ethanol (C₂H₆O).

5.5

anhydrous sodium sulfate (Na₂SO₄).

After burning at 550 ° C for 4 h, it was cooled and placed in a ground glass bottle and stored in a desiccator.

5.6

Magnesium silicate (MgSiO₃). 150 μm~250 μm (100 mesh to 60 mesh).

After burning at 550 ° C for 4 h, after cooling, weigh the appropriate amount of magnesium silicate in a ground glass bottle, according to the weight of magnesium silicate, press Add 6% (m/m) of the appropriate amount of distilled water, tightly plug and shake for a few minutes, let stand for 12 h, set aside.

5.7

Petroleum standard stock solution. ρ = 1 000 mg/L.

Direct purchase of commercially available n-hexane systems for certified reference materials/samples as determined by UV spectrophotometry.

5.8

Petroleum standard use solution. ρ=100 mg/L.

Accurately transfer 5.00 ml of petroleum standard stock solution (5.7) to a 50 ml volumetric flask and make up to volume with n-hexane (5.3).

Shake well. Can be saved for 24 h.

5.9

Glass wool.

Dip with n-hexane (5.3) for at least 15 min, dry and place in a dry glass bottle for later use.