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

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Replacing GB/T 7488-1987

**Water quality. Determination of biochemical oxygen demand
after 5 days(BOD₅) for dilution and seeding method**

水质 五日生化需氧量(BOD₅)的测定 稀释与接种法

(English Translation)

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Foreword

To protect the environment and protect the human body in order to implement the Environmental Protection Law of the People's Republic of China and the Law of the People's Republic of China on Water Pollution Prevention and Control this standard is established for the determination of the five-day biochemical oxygen demand (BOD₅) in the water.

This standard specifies the method for determining the dilution and inoculation of BOD₅ on surface water, industrial wastewater and domestic sewage.

This standard is a revision of the "Dilution and Inoculation Method for the Determination of Biochemical Oxygen Demand (BOD₅) on the 5th Day of Water Quality" (GB 7488-87).

This standard is modified to use ISO 5815-1:2003 "Determination of water quality n day biochemical oxygen demand (BOD_n). Part 1. Adding propylene Determination of the thiourea dilution and inoculation method and ISO 5815-2:2003 "Water quality n day biochemical oxygen demand (BOD_n) determination Part II.

Non-dilution method (English version). For the convenience of comparison, the chapter number of this standard and ISO 5815-1, 2 are listed in the informative Appendix A.

A comparison checklist of the 2003 chapter number is for reference.

This standard was first published in 1987. The original standard was drafted by Beijing Institute of Civil Engineering and Architecture. This is the first revision.

The main contents of this revision are as follows.

- Increased detection limits;
- The principle of the method clearly specifies the culture temperature and time, and increases the content of (25) days of cultivation;
- increased the choice of inoculum;
- Increased sample pretreatment method content;
- Increased the content of the method for determining the dilution factor of the dilution inoculation method;
- Refined the method for determining the biochemical oxygen demand on the 5th day;
- Added quality assurance and quality control chapters.

The national environmental protection standard "Water quality approved and issued by the former National Environmental Protection Agency on March 14, 1987 since the implementation of this standard.

The 5th day biochemical oxygen demand (BOD₅) determination of dilution and inoculation method (GB 7488-87) was abolished.

Appendix A of this standard is an informative annex.

This standard was formulated by the Science and Technology Standards Department of the Ministry of Environmental Protection.

This standard is mainly drafted by. Shenyang Environmental Monitoring Center Station.

This standard was approved by the Ministry of Environmental Protection on October 20, 2009.

This standard has been implemented since December 1, 2009.

This standard is explained by the Ministry of Environmental Protection.

Water quality five-day biochemical oxygen demand (BOD₅) determination dilution and inoculation method Warning. Propylene thiourea is a toxic compound. Wear protective equipment when handling. Avoid contact with skin.

And the preparation of the standard solution should be carried out in a fume hood; the residual residue after the test should be properly and safely disposed.

1 Scope of application

This standard specifies the method for determining the dilution and inoculation of BOD₅ in water for five days.

This standard applies to the determination of BOD₅ in surface water, industrial wastewater and domestic sewage.

The detection limit of the method is 0.5 mg/L, the lower limit of determination of the method is 2 mg/L, and the upper limit of determination by non-dilution method and non-dilution method is 6 the upper limit of the mg/L, dilution and dilution inoculation method is 6 000 mg/L.

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/T 6682 Analytical laboratory water specifications and test methods GB/T 7489 Determination of dissolved oxygen in water - Iodometric method GB/T 11913 Determination of dissolved oxygen in water - Electrochemical probe method HJ/T 91 Surface Water and Wastewater Monitoring Technical Specifications

3 Principle of the method

Biochemical oxygen demand refers to the decomposition of certain oxidizable substances in water, especially organisms that decompose organic matter, under specified conditions.

Dissolved oxygen consumed by the chemical process. Usually, the water sample is filled in a completely closed dissolved oxygen bottle and cultured in the dark at $(20 \pm 1) ^\circ\text{C}$.

$5\text{d} \pm 4\text{ h}$ or $(2.5 \pm 0.4)\text{ d}$ [first cultured in the dark at $0 \sim 4 ^\circ\text{C}$ for 2 d, then cultured in the dark at $(20 \pm 1) ^\circ\text{C}$ for 5 d, ie culture $(2.5 \pm 0.4)\text{ d}$], respectively, determine the mass concentration of dissolved oxygen in the water sample before and after the culture, and calculate the difference in mass concentration of dissolved oxygen before and after the culture.

The amount of dissolved oxygen consumed is expressed in the form of BOD₅.

If the content of organic matter in the sample is large, the mass concentration of BOD₅ is greater than 6 mg/L, and the sample needs to be properly diluted and determined;

Industrial wastewater with low microorganisms, such as acidic wastewater, alkaline wastewater, high-temperature wastewater, cryopreserved wastewater, or wastewater treated with chlorination, Inoculation should be carried out in the determination of BOD₅ to introduce microorganisms capable of decomposing organic matter in wastewater. When it is

difficult to be used by ordinary domestic sewage when the microorganisms in the microorganisms degrade at a normal rate or contain highly toxic substances, the domesticated microorganisms should be introduced into the water samples for inoculation.

4 Reagents and materials

The reagents used in this standard are analyzed using analytical reagents that meet national standards unless otherwise stated.

4.1

Water. The experimental water is Grade 3 distilled water in accordance with GB/T 6682, and the mass concentration of copper ions in the water is not more than 0.01 mg/L.

Does not contain substances such as chlorine or chloramine.

4.2

Inoculum. Inoculum for inoculation of microorganisms can be purchased. The preparation and use of the inoculum should be carried out in accordance with the instructions. Can also press the next method is to obtain an inoculum.

4.2.1

Domestic sewage not contaminated by industrial wastewater. chemical oxygen demand is not more than 300 mg/L, total organic carbon is not more than 100 mg/L.

4.2.2

River water or lake water containing urban sewage.

4.2.3

The effluent from the sewage treatment plant.

4.2.4

When analyzing industrial wastewater containing refractory substances, take a water sample at the appropriate place downstream of the sewage outlet as a domesticated inoculum for wastewater. and also it is advisable to neutralize or properly dilute the wastewater for continuous aeration, add a small amount of this kind of wastewater every day, and add a small amount of domestic sewage to make it suitable.

Microorganisms that should be planted with water are multiplied. When a large amount of floc appears in the water, it indicates that the microorganism has propagated and can be used as an inoculum. general the domestication process takes 3-8 days.

4.3 Salt solution