

HJ

INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

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**Water quality. Determination of total coliforms and fecal
coliforms. Paper strip method**

水质 总大肠菌群和粪大肠菌群的测定 纸片快速法

(English Translation)

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Table of Contents

Foreword

1	Determination of total coliforms and fecal coliforms in water quality
2	Terms and definitions
2.1	Total coliforms total coliforms
2.2	Fecal coliforms fecal coliforms
3	Principle of the method
4	Reagents and materials
4.2	Sterile water
4.3	Sodium thiosulfate solution. $\rho(\text{Na}_2\text{S}_2\text{O}_3)=0.10 \text{ g/ml}$
5	Instruments and equipment
6	Samples
6.1	Sample Collection
6.2	Sample storage
6.3	Interference and elimination
7	Analysis steps
7.1	Preparation for inoculation of water samples
7.2	Water sample inoculation
7.3	Cultivation
7.4	Controlled trial
7.5	Interpretation of results
58	Calculation and representation of results

Foreword

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, to protect the environment, this standard is formulated to ensure human health and to regulate the determination of total coliforms and fecal coliforms in water.

This standard specifies the rapid method for the determination of total coliforms and fecal coliforms in surface water and wastewater.

This standard is the first release.

Appendix A and Appendix B of this standard are informative annexes.

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

This standard is mainly drafted by. Changzhou Environmental Monitoring Center and Environmental Standards Research Institute of the Ministry of Environmental Protection.

The standard verification unit. Shanghai Environmental Monitoring Center, Jiangsu Environmental Monitoring Center, Zhejiang Environmental Monitoring Center, Suzhou Environmental Monitoring Center Station, Nanjing Environmental Monitoring Center Station and Taizhou Environmental Monitoring Center Station.

This standard was approved by the Ministry of Environmental Protection on October 22, 2015.

This standard has been implemented since December 1, 2015.

This standard is explained by the Ministry of Environmental Protection.

1 Determination of total coliforms and fecal coliforms in water quality

1 Scope of application this standard specifies a rapid method for the determination of total coliforms and fecal coliforms in water.

This standard applies to the rapid determination of total coliforms and fecal coliforms in surface water and wastewater.

The detection limit of this method is 20 MPN/L.

2 Terms and definitions

The following terms and definitions apply to this standard.

2.1 Total coliforms total coliforms

Cultured at 37 ° C, can ferment lactose to produce acid-producing aerobic and facultative anaerobic Gram-negative Bacillus sp.

2.2 Fecal coliforms fecal coliforms

Cultured at 44.5 ° C, can ferment lactose to produce acid-producing aerobic and facultative anaerobic Gram-negative Bacillus sp.

2.3 The maximum possible number of most probable number, MPN Microbial test The commonly used fermentation method, also known as the dilution method, is a method for quantitatively detecting the concentration of microorganisms using statistical principles. It is based on not the frequency of the presence or absence of the tested microorganisms in a

certain volume of the same dilution, the table looks for the concentration of microorganisms in the sample, and directly reports the number of colonies.

The plate count method is different, it finally reports the target microorganism concentration most likely to exist in the sample, which is the maximum possible concentration, it is called the most probable number (abbreviated as MPN).

3 Principle of the method

According to the MPN method, a certain amount of water sample is inoculated by aseptic operation to adsorb the appropriate amount of indicator (bromocresol purple and 2,3,5-chlorinated three Phenyltetrazolium (TTC) and lactose and other nutrients on sterile filter paper, cultured at a specific temperature (37 ° C or 44.5 ° C) for 24 h, when fine when the bacteria grow and multiply, acid production lowers the pH value, and the bromocresol purple indicator changes from purple to yellow. At the same time, the corresponding dehydrogenase in the gas production process is suitable.

In the pH range, the catalytic substrate is dehydrogenated to reduce TTC to form red insoluble tribendamide (TTF), which can be displayed under the yellow background after acid production.

Red spots (or blush). Through the color change of the above indicator, it is possible to judge whether or not the acid is produced, thereby determining whether there is a total Intestinal flora or fecal coliforms exist, and the concentration of the corresponding total coliform or fecal coliforms can be obtained by examining the MPN table.

4 Reagents and materials

Analytical purification reagents that meet national standards were used for analysis unless otherwise stated.

4.1

Commercial water quality total coliform and fecal coliform test paper. 10 ml water sample paper, 1 ml water sample paper the quality is identified as follows, and can be used after meeting the requirements.

(1) The outer aluminum foil packaging bag should be sealed and the inner packaging polypropylene plastic film bag is not damaged.

(2) The appearance of the paper sheet should be neat and burr-free, without damage, and it will be evenly yellowish green. It will be purple after adding deionized water or distilled water, no matter adding water and

2 No, there should be no mottling spots, no obvious deformation, and the surface is flat.

(3) The paper is added to the corresponding water sample. After fully infiltrating and

absorbing, the inner packaging polypropylene plastic film bag is inverted, and the mouth of the bag should be suspended without water drops.

(4) After the paper sheet is sufficiently wetted with deionized water or distilled water, the pH should be in the range of 7.0 to 7.4.

(5) Paper and inner packaging polypropylene plastic film bags should be sterile, add the appropriate amount of sterile water, culture at $37^{\circ}\text{C} \pm 1^{\circ}\text{C}$ for 24 h, the paper should be no Microbial growth, its purple color remains unchanged, and no erythema appears.

(6) According to the method in 7.4.2, the total coliform and fecal coliforms are negative and positive standard strains are tested, and their characteristics should meet the requirements.

4.2 Sterile water

Prepare with freshly prepared deionized water or distilled water, autoclave at 121°C for 20 min, and set aside.

4.3 Sodium thiosulfate solution. $\rho(\text{Na}_2\text{S}_2\text{O}_3)=0.10\text{ g/ml}$

Weigh 10 g of sodium thiosulfate, dissolve in an appropriate amount of distilled water (or deionized water), dilute to 100 ml, and mix.

4.4 Ethylenediaminetetraacetic acid disodium (EDTA- Na_2) solution.

$\rho(\text{C}_{10}\text{H}_{14}\text{N}_2\text{O}_8\text{Na}_2 \cdot 2\text{H}_2\text{O})=0.15\text{ g/ml}$ Weigh 15 g of EDTA- Na_2 , dissolve it in an appropriate amount of distilled water (or deionized water), dilute to 100 ml, and the shelf life of this solution is 30 d.

5 Instruments and equipment

5.1

Constant temperature incubator. $37^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

5.2

Constant temperature incubator. $44.5^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$.

5.3

High pressure steam sterilizer. 121°C , 101.3 kpa.

5.4

Refrigerator. $0 \sim 4^{\circ}\text{C}$.

5.5

Pipette. $1 \pm 0.01\text{ ml}$, $10 \pm 0.1\text{ ml}$.