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GB/T 11446.10-2013

Replacing GB/T 11446.10-1997

Test method for total bacterial count in electronic grade water by membrane filters

电子级水中细菌总数的滤膜培养测试方法

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Foreword

The estimated structure of GB/T 11446 is as follows:

- GB/T 11446.1 Electronic grade water;
- GB/T 11446.2 (To be determined);
- GB/T 11446.3 Generic rules for test methods of electronic grade water;
- GB/T 11446.4 Test methods for resistivity of electronic grade water;
- GB/T 11446.5 Test method for measuring trace metals in electronic grade water by atomic absorption spectrophotometry;
- GB/T 11446.6 Test method for SiO₂ in electronic grade water by spectrophotometer;
- GB/T 11446.7 Test method for trace anion in electronic grade water by ion chromatography;
- GB/T 11446.8 Test method for total organic carbon in electronic grade water;
- GB/T 11446.9 Test method for particles in electronic grade water by instrument;
- GB/T 11446.10 Test method for total bacterial count in electronic grade water by membrane filters.

This part is part 10 of GB/T 11446.

This part was drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces GB/T 11446.10-1997 “Test method for total bacterial count in electronic grade water by membrane filters”.

As compared with GB/T 11446.10-1997, the main changes of this part are as follows:

- In clause 3 “Terms and definitions”, REMOVE the definition of “sterile operation”, ADD the definitions of “total bacteria” and “medium” (SEE clause 3);
- ADD clause 5 “interference factors” (SEE clause 5);
- DELETE clause 10 “Considerations” (SEE clause 10 of the 1997 version).

This part was proposed by the Ministry of Industry and Information Technology

Test method for total bacterial count in electronic grade water by membrane filters

1 Scope

This part of GB/T 11446 specifies the test method for total bacterial count (live bacteria) in electronic grade water by membrane filters.

This part applies to the determination of the total bacterial count in EW - I ~ EW - IV electronic grade water.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB/T 11446.1-2013 Electronic grade water

GB/T 11446.3-2013 Generic rules for test methods of electronic grade water

3 Terms and definitions

The terms and definitions defined in GB/T 11446.3-2013 and the following terms and definitions apply to this document.

3.1

Bacterium colony

After a single cell or spore is cultured on a solid medium for a certain period of time, it grows and multiplies to form a macroscopic microorganism colony, which is a colony.

3.2

Bacterium culture method

A certain amount of water sample is filtered through an ultrafiltration membrane, and bacteria remaining on the surface of the ultrafiltration

- 2 - Filter membrane;
- 3 - Membrane carrier network;
- 4 - Suction filter bottle;
- 5 - Buffer bottle;
- 6 - Vacuum pump.

Figure 1 -- Schematic diagram of suction filtration system

8 Operation procedures

8.1 Preparation before testing

8.1.1 TURN on the sterile chamber or sterile workbench for 1 h ~ 2 h, then MAKE it into a stable working state.

8.1.2 Sterilization of vessels: First USE electronic grade EW-I water to wash the Petri dishes, sampling bottles, and other glassware clean, BAKE it dry, USE paper to wrap it tightly, PLACE it into a dedicated aluminum vessel, PLACE it into a thermostat (160 °C ~ 165 °C) to dry and sterilize it or 2 h.

8.1.3 Sterilization of organic filters: BOIL it for 15 minutes in electronic grade water, DISCARD boiling water, ADD fresh water to boil it, REPEAT it for 3 times, or otherwise STERILIZE it under UV light for 1 h ~ 2 h.

Note: Pay attention to safety when sterilizing.

8.2 Water sample determination

TAKE 2.0 mL of T.T.C solution, DROP it into 100 mL of medium at the temperature of $46\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$, MIX it uniformly in the Petri dish (about 3 mm ~ 4 mm thick), COOL it to prepare for use. SHAKE it uniformly, TAKE appropriate amount of water sample: 20 mL ~ 100 mL from EW - I ~ EW - III grade water, 1 mL from EW - IV grade water, USE filtration device to filter it, USE 50 mL of blank water to flush it, EMPTY it. USE tweezers to place the filter membrane on the prepared medium, LET the membrane surface face upwards, COVER the lid; after setting, INVERSE the plate and PLACE it into the incubator to incubate it at $37\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ for 48 h. TAKE it out, OBSERVE the colonies under a stereomicroscope and COUNT it. FOLLOW the same procedure to perform a blank test. DETERMINE each sample for 3 times in a parallel manner, TAKE the average value.

9 Measurement result calculation

The total bacterial count in water is calculated in accordance with formula (1):

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