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

GB/T 11446.4-2013

Test method for resistivity of electronic grade water

电子级水电阻率的测试方法

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Foreword

The expected 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 method 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 4 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 11446.4-1997 "Test methods for resistivity of electronic grade water". Compared with GB/T 11446.4-1997, this Part mainly has the following changes. - In "

3 Terms and definitions", ADD the definition of "Cell constant" (see Chapter 3); - ADD "

1 Scope

GB/T 11446.4-2013 is the Chinese national standard on test method for resistivity of electronic grade water, in the field of electronics. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers

meet it. It was issued on 31 December 2013 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 15 August 2014. Classification: ICS 31.030, CCS L90. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Part of GB/T 11446 specifies the test method for the electrical resistivity of electronic grade water. This Part applies to the testing of resistivity of 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) is 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 as defined in GB/T 11446.3-2013, as well as the following terms and definitions, apply to this document.

3.1 Electrical conductivity The conductivity is the reciprocal of the resistivity, which is represented by the symbol δ , in the unit of Siemens per centimeter (S/cm). The theoretical conductivity of pure water is $0.05482 \mu\text{S/cm}$ (25°C).

4 Measuring principle

To measure the resistivity of water, a conductivity cell is required. When the two electrode plates of the parallel plate cell are filled with water, the effective distance between the two electrode plates is L (cm); the cross-sectional area of the space is A (cm^2). Then the cell constant J (cm^{-1}) is calculated according to formula (1).

5 Disturbing factors

5.1 Changes in the cell constant and temperature compensation, of the resistivity meter or conductivity meter, which is used for measurement, have an impact on the measurement results.

5.2 If the water sample absorbs or loses dissolved gas, it will change the conductivity.

Strictly avoid exposing the water sample in the air.

6 Reagents

6.1 Water The EW-I electronic grade water, which is specified in GB/T 11446.1-2013. The water, which is used to prepare the potassium chloride conductivity standard solution, shall be exposed to the laboratory atmosphere, to achieve equilibrium.

6.2 Potassium chloride standard solution Bake the solid conductivity standard potassium chloride (standard substance BW 0401) at 110 °C, for 2 h, before use. Then put it in a desiccator, to cool to room temperature, before use.

7 Measuring instruments

7.1 Conductivity meter For the instrument used in this method, the AC signal, that passes through the conductivity cell, during measurement, shall be an AC signal; its frequency can be in the range of

25 Hz ~ 100 Hz. The measuring range of the thermometer shall be 0 °C ~ 35 °C, which has an accuracy of 0.1 °C.

7.4 Constant temperature water bath 25 °C ± 0.1 °C constant temperature water bath.

8 Measurement procedures

8.1 Determination of the cell constant Use the electronic grade water, that is exposed to the laboratory air, where the air reaches an equilibrium with the carbon dioxide in the air, to thoroughly clean the conductivity cell. Then use the corresponding potassium chloride standard solution, to rinse it 3 times.

8.2 Dynamic measurement of resistivity

8.2.1 Connect the measuring device to the water preparation system. Lead in water, to drive away the bubbles in the pipe and conductivity cell. Adjust the water flow rate (generally not less than

0.3 m/s). Install a thermometer, at the outlet of the conductivity cell.

9 Report

The test report shall be prepared, according to the format given in GB/T 11446.3-2013.

Appendix A

(Normative) Temperature correction curve of resistivity The temperature correction curve of resistivity is as shown in Figure A.1.