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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 11446.6-2013

Replacing GB/T 11446.6-1997

Test method for SiO2 in electronic grade water by spectrophotometer

电子级水中二氧化硅的分光光度测试方法

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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 6 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 11446.6-1997 "Test method for SiO2 in electronic grade water by spectrophotometer". Compared with GB/T 11446.6-1997, this Part mainly has the following changes. - MODIFY "

1 Scope

GB/T 11446.6-2013 is the Chinese national standard on test method for sio2 in electronic grade water by spectrophotometer, 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 spectrophotometric test method for silicon dioxide, in electronic grade water. This Part applies to the determination of silicon dioxide, in electronic grade water, where the detection limit is 1 μg/L.

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

3 Terms and definitions

The terms and definitions as defined in GB/T 11446.3-2013, as well as the following terms and definitions, are applicable to this document.

4 Principles of the method

Soluble silicon in water reacts with ammonium molybdate, in an acidic medium (pH = 1 ~ 2), to produce yellow silicon copper heteropoly acid (NH4)2H6[Si(MO2O7)6]·H2O.

5 Disturbing factors

5.1 Phosphate and arsenate, etc. generate the corresponding blue heteropoly acid, under the measurement conditions. The oxalic acid, tartaric acid and other hydroxy acids can be used, to eliminate the interference from arsenic and phosphorus.

5.4 The water sample shall be analyzed as soon as possible. The longer the storage time, the greater the possibility of contamination.

6 Reagents

6.1 Blank water EW-I electronic grade water, which is specified in GB/T 11446.1-2013.

6.2 Silicon standard solution

6.3 Ammonium molybdate solution (100 g/L) The analytically pure ammonium molybdate is purified by two recrystallizations.

6.4 Oxalic acid solution or tartaric acid or citric acid solution (100 g/L) Weigh 100 g of oxalic acid or tartaric acid or citric acid. Dissolve it in 500 mL water. Use water to dilute to 1 L (if the solution is turbid, filter it). Store it in a polyethylene bottle. 6.5 1-Amino-2-naphthol-4-sulfonic acid reducing agent solution Weigh

1.5 g of 1-amino-2-naphthol-4-sulfonic acid AND 7 g of anhydrous sodium sulfite. Dissolve it in 200 mL of water.

6.6 Hydrochloric acid (1+1) Hydrochloric acid, which is purified by distillation or absorption.

6.7 Hydrofluoric acid (1+99) Hydrofluoric acid, which is purified by a platinum distiller.

6.8 Boric acid solution Saturated solution, which is prepared by boric acid, after purified by recrystallization.

7 Instruments and utensils

7.1 Spectrophotometer. The working wavelength is 200 nm ~ 1000 nm; the wavelength accuracy is ±

1.5 nm; the transmittance range is 0 ~ 100%; the transmittance repeatability is ±0.5%; the absorbance measurement range is 0.04 ~ 2; the cuvette is 1 cm, 2 cm, 5 cm, 10 cm.

7.5 Polyethylene bottle (cup). 100 mL, 1000 mL.

7.6 Glassware with complete specifications.

7.7 Polyethylene volumetric flask. 50 mL, 100 mL.

8 Sampling

The water container, which is used to analyze silicon, shall use plastic containers, such as polyethylene, according to Chapter 4 of GB/T 11446.1-2013.

9.1 Drawing of working curve

9.1.1 The silica content in the water sample to be tested is 1 μg/L ~ 200 μg/L

9.1.2 The silica content in the water sample to be tested is 100 μg/L ~ 2000 μg/L

9.3 Water sample determination

9.3.1 Determination of soluble silicon Take 50 mL of water sample in a polyethylene bottle. Follow the steps in 9.1, to use blank water as a reference, for photometric determination.

Find the silica content, which is corresponding to the difference, between the absorbance of the reagent and the absorbance of the reagent blank, from the working curve, which is content of soluble silicon in the water sample.

10 Detection limit and relative deviation

This method analyzes the silica content in electronic grade water. The detection limit is 1 μg/L. For the analysis of 10 μg/L (silica) water, the relative deviation is 8%.