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

GB/T 14571.1-2016

Replacing GB/T 14571.1-1993

**Test method of monoethylene glycol for industrial use - Part 1:
Determination of acidity - Titration method**

工业用乙二醇试验方法 第1部分：酸度的测定 滴定法

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Foreword

GB/T 14571 consists of the following parts. GB/T 14571.1, Test method of monoethylene glycol for industrial use - Part 1. Determination of acidity - Titration method GB/T 14571.2, Test method of ethylene glycol for industrial use - Part 2. Determination of purity and impurities - Gas chromatography GB/T 14571.3, Ethylene glycol for industrial use - Determination of content of total aldehydes present - Spectrophotometric method GB/T 14571.4, Ethylene glycol for industrial use - Determination of ultraviolet transmittance - Ultraviolet spectrophotometric method GB/T 14571.5, Test method of monoethylene glycol for industrial use - Part 5. Determination of chloride ion - Ion chromatography This Part is Part 1 of GB/T 14571. This Part was drafted in accordance with the rules given in GB/T 1.1-2009. This Part replaces GB/T 14571.1-1993. Compared with GB/T 14571.1-1993, main technical changes in this Part are as follows: - added the scope (see Clause 1 of this Edition, Clause 1 of Edition 1993); - added potentiometric titration method (see Clause 4 of this Edition); - modified the unit of acidity from % (mass fraction) to mg/kg. This Part was proposed by China Petrochemical Corporation. This Part shall be under the jurisdiction of Subcommittee on Petrochemical of National Technical Committee on Chemicals of Standardization Administration of China (SAC/TC 63/SC4). The drafting organization of this Part. China Petroleum & Chemical Corporation Beijing Yanshan Branch. Main drafters of this Part. Qi Guiyi, Cui Guanghong, Jiang Liancheng, Yu Hongguang, Cheng Hong. Version

of standard substituted by this Part is. - GB/T 14571.1-1993. Test method of monoethylene glycol for industrial use - Part

1.Determination of acidity - Titration method WARNING. This Part is not intended to describe all security issues related to its use. It is the responsibility of the user to take appropriate safety and health measures to ensure the compliance with relevant national regulations.

1 Scope

GB/T 14571.1-2016 is the Chinese national standard on test method of monoethylene glycol for industrial use - part 1: determination of acidity - titration method, in the field of chemical technology. 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 13 October 2016 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 1 May 2017. Classification: ICS 71.080.60, CCS G16. 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 14571 specifies manual titration method and potentiometric titration method for determination of acidity of monoethylene glycol for industrial use. Manual titration method of this Part is applicable to the determination of monoethylene glycol for industrial use of which the acidity is 2mg/kg~200mg/kg. Potentiometric titration method is applicable to the determination of monoethylene glycol for industrial use of which the acidity is 1mg/kg~200mg/kg.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 601, Chemical reagent - Preparations of reference titration solutions

GB/T 603, Chemical reagent - Preparations of reagent solutions for use in test methods

GB/T 3723, Sampling of chemical products for industrial use - Safety in sampling

GB/T 6680, General rules for sampling liquid chemical products

GB/T 6682, Water for analytical laboratory use - Specification and test methods

GB/T 8170, Rules of rounding off for numerical values & expression and judgement of limiting values

3 Test method A -- Manual titration method

3.1 Method summary Dissolve monoethylene glycol sample in water. Use sodium hydroxide standard solution to titrate acid in the sample. Use phenolphthalein indicator liquid discoloration to indicate the titration end. Calculate the sample acidity according to the amount of sodium hydroxide standard solution consumed, in acetic acid (mg/kg).

3.2 Reagents and materials

3.2.1 Unless otherwise stated, all reagents are analytical reagents. All standard solutions, preparations used are prepared according to GB/T 601 or GB/T 603. All water used meet the specification of grade three specified in GB/T 6682.

3.3 Instruments and devices

3.3.1 Analytical balance. resolution is 0.0001g.

3.3.2 Erlenmeyer. 500mL, with open grinder and nitrogen blowpipe, as shown in Figure 1.

3.4 Sampling Perform sampling according to the requirements specified in GB/T 3723 and GB/T 6680.

3.5 Analysis steps Make access of nitrogen to a 500mL Erlenmeyer at a flow rate of 300mL/min~500mL/min for about 5min. Under nitrogen-access conditions, use a measuring cylinder to measure and take 100mL of water into the Erlenmeyer.

4 Test method B -- Potentiometric titration method

4.1 Method summary Use sodium hydroxide standard solution to titrate acid in monoethylene glycol sample. Use potentiometric titrator to titrate and determine the end. Calculate the sample acidity according to the amount of sodium hydroxide standard solution consumed, in acetic acid (mg/kg).

4.3 Instruments and devices

4.3.1 Potentiometric titrator. 5mL burette; be able to realize constant or dynamic increment mode; be able to titrate in increments of 0.02mL or more.

4.4 Instrument preparation

4.4.1 Boot preparation Start the titrator according to the instruction manual. Start blender. Control blending speed. It is better to not generate vortex. Make sure there are no bubbles in the burette.

4.4.2 Electrode preparation and maintenance Store and use electrodes according to manufacturer description. Before each titration, the electrode shall be immersed in water for at least 2min.

4.4.3 Instrument calibration Respectively place 50mL of two buffer solutions of which pH values are about

7.0 into 125mL beakers. Perform instrument calibration according to the requirements of manufacturer's instruction manual. Immerse the electrode in buffer solution.

4.5 Sampling Sampling requirements are same as 3.4.

4.6 Analysis steps

4.6.1 Weigh (85 ± 5) g of monoethylene glycol sample in the titration beaker, to the nearest of 0.001g.

5 Calculation

The monoethylene glycol acidity w_i (in acetic acid), in mg/kg, is calculated according to formula (1).

6 Expression of analysis results

For any sample, report the results of the analysis by the arithmetic mean of the results of two repeated measurements. Round off according to the provisions of GB/T 8170, to the nearest of 0.1mg/kg.

7 Repeatability

In the same laboratory, the same operator uses the same device. According to the same test method, test the same test object independently of each other in a short time.