

Translated English of Chinese Standard: GB/T14571.1-2016

www.ChineseStandard.net → Buy True-PDF → Auto-delivery.

Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 71.080.60

G 16

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

Issued on: October 13, 2016

Implemented on: May 01, 2017

Issued by: General Administration of Quality Supervision, Inspection and Quarantine;

Standardization Administration of the People's Republic of China.

Table of Contents

| | |
|--|----|
| Foreword | 3 |
| 1 Scope | 4 |
| 2 Normative references | 4 |
| 3 Test method A -- Manual titration method | 5 |
| 4 Test method B -- Potentiometric titration method | 7 |
| 5 Calculation | 9 |
| 6 Expression of analysis results | 9 |
| 7 Repeatability | 10 |
| 8 Test report | 10 |

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

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*

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).

4.2 Reagents and materials

4.2.1 Same with 3.2.1.

4.2.2 Sodium hydroxide standard titration solution: $c(\text{NaOH})=0.01\text{mol/L}$.

4.2.3 pH buffer solution: pH values are about 4.0 and 7.0. Sell at market or prepare according to the following methods:

- a) Buffer solution of which pH is 4: Measure and take 10.12g of potassium hydrogen phthalate reference reagent that has been dried at $(115.0\pm 5.0)^\circ\text{C}$ for 2h~3h. Dissolve in carbon dioxide free water. Dilute to 1000mL at 25°C ;
- b) Buffer solution of which pH is 7: Measure and take 4.81g of potassium dihydrogen phosphate reference reagent that has been dried at $(115.0\pm 5.0)^\circ\text{C}$ for 2h~3h. Add 291mL of 0.1mol/L sodium hydroxide solution. Use carbon dioxide free water to dilute to 1000mL at 25°C .

4.2.4 Lithium chloride ethanol electrolyte: 1mol/L~3mol/L lithium chloride ethanol solution. Prepare or sell at market according to the method recommended by the manufacturer.

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.

4.3.2 Composite pH electrode: built-in Ag/AgCl reference electrode in the electrode. It is recommended to use a non-aqueous composite pH electrode designed for non-aqueous titration of organic solutions. Composite pH electrode has casing and reference chamber connected. Use 1mol/L~3mol/L lithium chloride ethanol solution as electrolyte. It is equipped with a movable sleeve that is easy to rinse and drip with electrolyte.

4.3.3 Titration beaker: borosilicate glass or plastic beaker, 125mL or specifications recommended by the manufacturer.

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.

4.6.2 Place sample titration beaker in the blender. Prepare electrodes according to manufacturer's instruction manual. Immerse the electrode and the tip of the burette into the sample. Adjust stirring speed to make sure sample is completely mixed but not generate a vortex.

4.6.3 Start titration. The potentiometric titrator determines the end point according to the potential sudden. Record the titration volume of this sample.

5 Calculation

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

$$w_i = \frac{c \times V \times 60.05 \times 1\ 000}{m} \dots\dots\dots(1)$$

Where,

c - Concentration of sodium hydroxide standard titration solution, in Molars per liter (mol/L);

V - Volume of sodium hydroxide standard titration solution consumed by sample titration, in milliliters (mL);

m - Mass of sample, in grams (g);

60.05 - Molar mass of acetic acid (CH₃COOH), in grams per Molar (g/mol).

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.

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----