

ICS 71.080.60
CCS G16



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

GB/T 14571.4-2022

Replacing GB/T 14571.4-2008

**Test method of ethylene glycol for industrial use - Part 4:
Determination of ultraviolet transmittance - Ultraviolet
spectrophotometric method**

工业用乙二醇试验方法 第4部分：紫外透光率的测定 紫外分光光度法

Issued on: April 15, 2022

Implemented on: November 1, 2022

**Issued by: State Administration for Market Regulation;
Standardization Administration of China**

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Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020 "Directives for standardization - Part

1.Rules for the structure and drafting of standardizing documents". This document is Part 4 of GB/T 14571 "Test method of ethylene glycol for industrial use". The following parts of GB/T 14571 have been issued. -- Part

1 Scope

GB/T 14571.4-2022 is the Chinese national standard on test method of ethylene glycol for industrial use - part 4: determination of ultraviolet transmittance - ultraviolet spectrophotometric 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 15 April 2022 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 November 2022. 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 document specifies the method for determination of the UV light transmittance of ethylene glycol for industrial use in the wavelength range of 200nm–350nm. This document is applicable to the determination of the UV light transmittance of ethylene glycol for industrial use.

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 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 and expression and judgement of limiting values JJG 178-2007, Verification Regulation of Ultraviolet, Visible, Near-Infrared Spectrophotometers

3 Determination of content of aldehydes; -- Part

4.Determination of ultraviolet transmittance - Ultraviolet spectrophotometric method; -- Part

5.Determination of chloride ion - Ion chromatography. This document replaces GB/T 14571.4-2008 "Ethylene glycol for industrial use - Determination of ultraviolet transmittance - Ultraviolet spectrophotometric method". Compared with GB/T 14571.4-2008, in addition to the structural adjustments and editorial changes, the main technical changes in this document are as follows:

a) The provisions for directly measuring and reporting the UV transmittance at each wavelength are added (see Chapter 4, 8.3.1,

9.1 of this Edition);

b) The preparation basis of "holmium oxide standard solution, potassium dichromate standard solution, sodium iodide standard solution" is changed (see 5.7, 5.8,

5.9 of this Edition; 4.2, 4.4,

4.6 of Edition 2008);

- c) The instrument performance requirements for "ultraviolet spectrophotometer" are changed (see 6.1 of this Edition; 5.1 of Edition 2008);
- d) The chapter "Instruments" is changed (see Chapter 6 of this Edition; Chapter 7 of Edition 2008);
- e) The pairing requirements for "quartz absorption cell" are added (see 6.2 of this Edition);
- f) The nitrogen purge flow rate and time are changed (see

4 Method summary

Place the specimen in a 10mm quartz absorption cell. Use water as a reference. Directly determine the UV transmittance at 220nm, 250nm, 275nm and 350nm.

5 Reagents or materials

- 5.1 Unless otherwise specified, all reagents used are analytically pure.
- 5.2 Holmium oxide wavelength calibration filter. qualified after calibration.
- 5.3 Transmittance filter in the ultraviolet region. qualified after calibration.
- 5.4 Cut-off filter.
- 5.5 Isooctane. spectrally pure.
- 5.6 Naphthalene solution (1mg/L). commercially available or dissolve 1mg of naphthalene in 1000mL of spectroscopically pure isooctane.
- 5.9 Sodium iodide standard solution (10g/L). prepare according to C.1 in JJG 178-2007.
- 5.10 Nitrogen. purity $\geq 99.99\%$ (volume fraction); without oil.
- 5.11 Reference water. grade one water in compliance with GB/T 6682; the absorbance at 220nm is not greater than 0.01. The absorbance of water shall be tested in accordance with Annex A.

6 Instruments

- 6.1 UV spectrophotometer Double beam. Determination wavelength is 200nm~400nm. The absorbance accuracy is better than 0.001. The working wavelength of the instrument is divided into two sections, namely section A (190nm~340nm) and section B (340nm~400nm).

6.2 Quartz absorption cell A quartz absorption cell with an optical path of $10\text{mm}\pm 0.01\text{mm}$ and a quartz absorption cell with an optical path of $20\text{mm}\pm 0.01\text{mm}$.

6.3 Nitrogen stripping device Fix the oil-free pressure reducing valve on the nitrogen cylinder or nitrogen pipeline. Connect with the flow control valve and the closed glass tube (6.6) inserted into the 25mL volumetric flask or Erlenmeyer flask through a pipeline of appropriate material (such as a polyethylene tube). All parts need to be clean and free from pollution. Specimen shall avoid contact with plastic products containing plasticizers.

6.4 Reagent bottles The capacity is at least 500mL. It is equipped with a bottle cap with good sealing.

6.5 Volumetric flasks or Erlenmeyer flasks Capacity is 25mL.

6.6 Closed glass tube Glass part of plastic head dropper.

7 Sampling

According to the provisions of GB/T 3723 and GB/T 6680, take samples at a gentle flow rate. When the distance between the liquid level and the bottle mouth is less than 10mm, stop sampling. Immediately cover to store sample. Avoid violent shaking of samples. Analyze as soon as possible.

8.1 Test preparation

8.1.1 Start-up preparation The instrument starts up and enters the hardware self-inspection. After a period of stability, set the instrument parameters. A bandwidth of 2.0nm is used.

8.1.2 Instrument verification

8.1.2.3 Stray light Use sodium iodide standard solution (5.9), or cut-off filter (5.4) to measure the transmittance of the photometer at 220nm (i.e., stray light), which shall meet the requirements of 6.1.

8.1.3 Glassware preparation Use hydrochloric acid-water-methanol solution (1.3.4, volume ratio) or chromic acid washing solution to thoroughly clean the absorption cell and other glassware.

8.3 Specimen analysis

8.3.1 Direct method Fill the reference water (5.11) into two paired 10mm quartz absorption cells. Place the absorption cell in the cell holder of the photometer.

8.3.2 Absorbance method Fill the reference water (5.11) into two paired 10mm quartz absorption cells. Place the absorption cell in the cell holder of the photometer. Pay attention to the direction of the absorption cell. Measure the absorbance at the wavelengths of