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Food additive propylene glycol

食品添加剂 丙二醇

(English Translation)

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Table of Contents

- 1 Scope
- 2 Molecular formula, structural formula and relative molecular mass
 - 2.1 Molecular formula
 - 2.2 Structural formula
 - 2.3 Relative molecular mass
- 3 Technical requirements
 - 3.1 Sensory requirements
 - 3.2 Physical and chemical indicators

1 Scope

This standard applies to propylene oxide and water as raw materials, direct hydration method of the food additive propylene glycol.

2.1 Molecular formula

C₃H₈O₂

2.2 Structural formula

H₃C

2.3 Relative molecular mass

76.10 (according to 2007 International Relative Atomic Quality)

3.1 Sensory requirements

Shall comply with the provisions of Table 1.

Table 1 sensory requirements

The project requires a test method Color and colorless State transparent, no sediment and suspended solids viscous liquid Take appropriate sample, placed in a clean, dry colorimetric tube, in natural light Line, observe the color and state

3.2 Physical and chemical indicators

Shall comply with the provisions of Table 2.

Table 2 Physical and chemical indicators

Item Index Test Method Propylene glycol content, w /% ≥ 99.5 Appendix A, A.4 Boiling range Initial boiling point/ $^{\circ}\text{C}$ ≥ 185 Dry point/ $^{\circ}\text{C}$ ≤ 189 GB/T 7534 Relative density (25 $^{\circ}\text{C}/25^{\circ}\text{C}$) 1.035 ~ 1.037 GB/T 4472 Moisture, w /% ≤ 0.2 GB/T 6283 the acidity passes through Test Appendix A in A.5 Cracking residue, w /% ≤ 0.007 Appendix A A.6 Lead (Pb)/(mg/kg) ≤ 1 Appendix A A.7 Appendix A Testing method A.1 Warning the test procedure specifies that some of the test procedures may lead to dangerous conditions and that the operator should take appropriate safety and protective measures.

A.2 General provisions Unless otherwise stated, only the reagents identified as analytical reagents and the tertiary water specified in GB/T 6682-2008 are used in the analysis.

Standard titration solution used in the test method, standard solution for the determination of impurities, preparations and articles, in the absence of other requirements, GB/T 601, GB/T 602 and GB/T 603. The solution used, when not specified refers to the aqueous solution.

A.3 Identification test Using infrared absorption spectroscopy. The infrared spectra of the samples were compared with the standard spectra in the range of 3800 cm^{-1} to 650 cm^{-1} the characteristic absorption peaks should be consistent.

A.4 Determination of propylene glycol content A.4.1 Methodological Summary Using gas chromatography. Under the selected chromatographic operating conditions, the samples were vaporized and separated by a column using a thermal conductivity detector (TCD) Detection, area normalization method quantification.

A.4.2 Reagents and materials Helium. volume fraction $\geq 99.9\%$.

A.4.3 Instruments and equipment A.4.3.1 Gas Chromatograph. equipped with thermal conductivity detector (TCD), the machine sensitivity and stability in line with GB/T 9722 requirements, linear Meet the analysis requirements.

A.4.3.2 Chromatographic Data Processor or Integrator.

A.4.3.3 Syringe. 1 mL.

A.4.4 Chromatographic operating conditions the recommended column and chromatographic operating conditions for this standard are given in Table A.1. Other columns and chromatographic columns that achieve the same degree of separation Pieces can also be used.

Table A.1 Recommended Columns and Typical Chromatographic Operating Conditions

Stationary Phase

Polyethylene glycol -20M coated on 0.25mm to 0.38mm red diatomaceous earth or suitable when the material. The fixation ratio was 1.25 Filled column stainless steel column, 1m x

8mm (column length x column diameter) the oven temperature was 120 ° C and the temperature was raised to 200 ° C at a rate of 5 ° C/min Vaporization chamber temperature/°C 240 Detector temperature/250 ° C Carrier gas (He) Flow rate/(mL/min) 75 Injection volume/μL 10 A.4.5 Analysis steps According to the instrument manual, adjust the instrument to the operating conditions shown in Table A.1, the instrument can be measured after the stability of the sample. With corrected area Normalization method.

The retention times of the three dipropylene glycol isomers in the chromatogram were 8.2 min, 9.0 min and 10.2 min, respectively.

A.4.6 Calculation of results the mass fraction w_1 of propylene glycol is calculated according to formula (A.1) $w_1 = \frac{\sum A_i}{\sum A_i + A_3} \times 100\%$ (A.1) where.

A - the peak area of propylene glycol;

A_i - the peak area of component i ;

w_3 - the value of the mass fraction of water in the measured sample.

The arithmetic mean of the results of two parallel measurements is the result of the measurement. The absolute difference between the two parallel determinations is not greater than 0.1%.

A.5 Determination of acidity A.5.1 Reagents and materials A.5.1.1 sodium hydroxide standard titration solution. $c(\text{NaOH}) = 0.01 \text{ mol/L}$.

A.5.1.2 phenolphthalein indicator solution. 10g/L.

A.5.2 Analysis steps Add about 50 mL of water in a 250 mL Erlenmeyer flask, add 3 to 6 drops of phenolphthalein indicator solution, titrate with titration solution with sodium hydroxide the solution was pink and held for 30 s. Weigh about 50g sample, accurate to 0.01g, add to the conical flask, with sodium hydroxide standard titration solution Liquid titration to the solution was pink and keep 15s, consumption of sodium hydroxide standard titration solution volume should not exceed 1.67mL.

A.6 Determination of burning residue A.6.1 Reagents and materials sulfuric acid.

A.6.2 Instruments and equipment A.6.2.1 Crucible. 100 mL.

A.6.2.2 High temperature furnace. Controlled temperature $800 \text{ }^\circ\text{C} \pm 25 \text{ }^\circ\text{C}$.

A.6.3 Analysis steps Weigh about 50g sample, accurate to 0.01g, placed in the crucible, heated to the sample lit, stop heating, to be burned, cooling crucible, Add 5mL sulfuric acid to wet the residue and heat until the white smoke disappears. The crucible into the high temperature furnace, at $800 \text{ }^\circ\text{C} \pm 25 \text{ }^\circ\text{C}$ burning 15min, take the crucible is placed in a desiccator to cool and weigh.

A.6.4 Calculation of results the mass fraction w_2 of the burning residue is calculated according to the formula (A.2) $w_2 = \frac{m_2 - m_1}{m} \times 100\%$ (A.2) where.

m1 --- the value of the mass of the empty crucible, in grams (g);

m2 --- crucible plus residue mass value, the unit is grams (g);

m - the mass of the sample, in grams (g).

A.7 Determination of lead (Pb) According to the method specified in GB 5009.12, the sample treatment is carried out according to GB/T 5009.75. The graphite furnace is used to absorb light when the spectrum is measured, the sample solution is properly diluted as viewed in the sample.