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

GB 30610-2014

National Food Safety Standard -- Food Additives -- Ethanol

食品添加剂 乙醇

(English Translation)

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1 Scope

This standard applies to direct catalytic hydration of ethylene was legal food additive ethanol.

2 Molecular formula, relative molecular mass and structural formula

Formula 2.1

C₂H₆O

2.3 Relative molecular mass

46.07 (according to 2007 international relative atomic mass)

3 Technical requirements

3.1

Sensory requirements. comply with Table 1.

Table 1 Sensory requirements

Project requires test methods Color colorless take appropriate sample in a clean, dry colorimetric tube, in natural light by visually observe its color and transparent liquid STATUS

3.2

Physical indicators. to comply with Table 2.

Table 2. Physical and chemical indicators

Item Index Test Method Ethanol content, phi /% >= 94.9 Appendix A A.4 Acidity (acetic acid)/(g/L) <= 0.05 Appendix A A.5 Alkalinity (ammonia dollars), w /% <= 0.003 A.6 in Appendix A Evaporation residue/(mg/100 mL) <= 2 GB/T 6324.2 Lead (Pb)/(mg/kg) <= 0.5 GB 5009.12 Ketones and other alcohols Total, w /% <= 0.5 Appendix A A.7 methanol, w /%

≤ 0.02 any other impurity, w /% ≤ 0.1 Fusel oil test by test A.8 in Appendix A Easy carbide test by test in A.9 in Appendix A Yi oxide test by test A.10 in Appendix A Appendix A Testing method A.1 Warning Some test procedures prescribed test method can lead to dangerous situations. The operator shall take appropriate safety and health practices.

A.2 General Provisions Unless otherwise indicated in the analysis using only recognized as analytical reagents and GB/T 6682 stipulated three water. Test Methods Standard titration solution, impurities measured by standard solution, preparations and products, did not indicate when the other requirements, according to GB/T 601, GB/T 602 and the provisions of GB/T 603 of preparation; the solution, unless otherwise indicated, are aqueous.

A.3 Identification Test A.3.1 solubility soluble in water. Pipette 50 mL sample, placed in 100 mL colorimetric tube, diluted to 100 mL, and mix at about 10 °C water bath Stand for 30 min, there should be no mist or haze appears.

A.3.2 Refractive index According to the provisions of GB/T 614 was measured. Refractive index n_D^{20} should be. 1.364.

A.3.3 boiling point

The method according to GB/T 7534 as specified in the measurement. Boiling point should be 78 °C.

A.3.4 IR

Infrared spectra of the sample should be consistent with the ethanol standard infrared spectrum. Infrared spectra of ethanol standard in Appendix B Figure B.1.

A.4 Determination of ethanol content A.4.1 Method One (Arbitration Act) Determination of ethanol content in ethanol relative density value is determined, according to GB/T 5009.2 provisions were measured. The relative density shall be. 25°C ≤ 0.8096 or 56.1556 ≤ 0.8161 . Equivalent alcohol content (volume fraction) of not less than 94.9%.

A.4.2 Method Two

According to the provisions in Chapter 5 GB 394.2-2008 alcohol content was measured.

A.5 Determination of acidity A.5.1 Reagents and materials A.5.1.1 sodium hydroxide standard titration solution. $c(\text{NaOH}) = 0.02 \text{ mol/L}$.

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

A.5.2 Analysis step

Equipped with 25 mL of water with a glass-stoppered flask, add 10 mL sample, add 0.5 mL of phenolphthalein indicator solution, titration with standard sodium hydroxide solution Titration to pink just appear, and kept unchanged 30s, then add 25 mL (about 20 g) sample, and mix. Then sodium hydroxide standard titration solution Volume droplet to the pink, the consumption of sodium hydroxide standard titration solution should not exceed 1.0 mL.

Acidity equivalent to not more than 0.05g/L.

A.6 Determination of alkalinity A.6.1 Reagents and materials A.6.1.1 sulfuric acid solution. c (H₂SO₄) = 0.02 mol/L;

A.6.1.2 methyl red indicator solution. 1 g/L.

A.6.2 Analysis step

In 25 mL of water add 2 drops of methyl red indicator solution, a solution of 0.02 mol/L sulfuric acid solution, until just red, then added 25 mL sample (about 20 g), and mix. Restoration of the red, adding the volume of 0.02 mol/L sulfuric acid solution is not more than 2.0 mL. Equivalent to ethanol not more than 0.003% basicity.

A.7 content ketones and other alcohols A.7.1 Method summary by gas chromatography under the selected chromatographic conditions, the sample after the separation column with flame ionization detector, surfaces Plot normalized quantification.

A.7.2 Instruments and Equipment A.7.2.1 Gas chromatograph. with hydrogen flame ionization detector. Overall sensitivity and stability in line with the relevant provisions of GB/T 9722 in.

A.7.2.2 micro syringe. 10 µL.

A.7.3 columns and operating conditions the recommended standard chromatographic columns and the operating conditions are shown in Table A.1. Others can achieve the same degree of separation columns and chromatographic operating conditions it can also be used.

Table A.1 Recommended chromatographic columns and operating conditions

Project Parameters

10% polyethylene glycol column packed column 400, and the carrier is 0.18mm ~ 0.25mm red Color Celite Column diameter column length x 1.8 m x 6.4 mm stainless steel column Column temperature/°C 90 Inlet temperature/°C 150 Detector temperature/°C 150 Carrier gas Helium Carrier gas flow rate/(mL/min) 45 Injection volume/µL 5 A.7.4 Analysis step According to the manufacturer's instructions, adjust the instrument to the operating conditions in Table A.1 shown after the instrument is stable to start injection analysis. Work by chromatography Station for processing the results.

A.7.5 Calculation Results the quality of a component under test scores w_i , according to equation (A.1) Calculated.

w_i (A.1)

Where.

A_i - a component of the measured peak area;

sumAi - all the components and peak area.

A.8 fusel oil test

Measure 10 mL sample, add 1 mL of glycerol and 1 mL of water, mix, dropwise on a clean, odorless filter paper, to natural evaporation Dry, should always be the same smell occurs.

A.9 carbide Easy Test Placed in 10 mL of sulfuric shift conical flask, cooled to about 10 °C, was added dropwise 10 mL of the sample, and the constant agitation. Color of the solution Colorless or not deep in the reagent or sample prior to mixing colors, namely through tests.

A.10 easy to oxide test A.10.1 reagents and materials Potassium permanganate solution. 0.1 mol/L.

A.10.2 Analysis steps Pipette 20 mL sample is placed in a pre-cooled to a colorimetric tube of 15 °C, add 0.1 mL of potassium permanganate solution, mix, still 5 min, powder Color not completely disappeared, namely through tests.

Appendix B

Infrared spectra of ethanol standard Ethanol standard infrared spectrum shown in Figure B.1.

Figure B.1 ethanol standard infrared spectrum