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

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Erythritol national food safety standards of food additives

食品添加剂 赤藓糖醇

(English Translation)

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1 Scope

This standard applies to the use of glucose as the main raw material, the use of *Candida lipolytica* (*Candidalipolytica*) (*Moniliellapollinis*) or *Trichosporonaceae* (*Trichosporonoides megachiliensis*) by fermentation into erythritol, and then through Refined and other processes to get the food additives erythritol crystal products.

2.1 Molecular formula

C₄H₁₀O₄

2.3 Relative molecular mass

122.12 (according to the 2007 International Relative Atomic Quality)

3 Technical requirements

3.1

sensory requirements. should be consistent with the provisions of Table 1.

Table 1 sensory requirements

The project requires a test method Color white Taste sweet Organizational state Crystalline powder or granules Take the appropriate amount of sample placed in a clean, dry white porcelain dish, in the natural light, Observe its color and state, and taste its taste

3.2

Physical and chemical indicators. should be consistent with the provisions of Table 2.

Table 2 Physical and chemical indicators

Item Index Test Method Erythritol (based on C₄H₁₀O₄, dry basis), w /% 99.5 to 100.5
Appendix A, A.3 Dry reduction, w /% ≤ 0.2 GB 5009.3 direct drying method a Residue on

ignition, w /% ≤ 0.1 A.4 in Appendix A.

Reducing sugar (in terms of glucose), w /% ≤ 0.3 Appendix A A.5 Ribosanol and glycerol (on a dry basis), w /% ≤ 0.1 A.6 in Appendix A.

Lead (Pb)/(mg/kg) ≤ 1 GB 5009.12 a Drying temperature and time are 105 °C and 4h respectively.

Appendix A

Testing method

A.1 General provisions the reagents and water used in this standard, when not specified in other requirements, refer to the analysis of pure reagents and GB/T 6682-2008 in the provisions of the three Water level. Standard titration solution used in the test, the standard solution for the determination of impurities, preparations and products, without any other requirements, GB/T 601, GB/T 602, GB/T 603. The solution used in the test refers to water when it is not specified with the formulation of the solvent Solution.

A.2 Identification test A.2.1 soluble in water, slightly soluble in ethanol, insoluble in ether.

A.2.2 Crystallization Melting point is 119 ° C to 123 ° C. According to the method specified in GB/T 617.

A.2.3 In the determination of erythritol content test, the retention time of the main peak in the chromatogram of the sample solution should be the same as that in the standard solution chromatogram Retention time is consistent.

A.3 Determination of erythritol (based on C₄H₁₀O₄, dry basis) (HPLC method) A.3.1 Reagents and materials A.3.1.1 Water. Class III water specified in GB/T 6682-2008.

A.3.1.2 erythritol standard. purity ≥ 99%.

A.3.2 Instruments and equipment High performance liquid chromatograph equipped with a refractive index detector.

A.3.3 Reference chromatographic conditions A.3.3.1 Mobile phase. heavy distilled water.

A.3.3.2 Columns. Hydrogen-type macroporous cation exchange resin packed columns, resin containing large mesh sulfonated polystyrene-divinylbenzene the degree of crosslinking was 8%, the particle size was 9 μm, or other equivalent column.

A.3.3.3 Flow rate. 0.6 mL/min.

A.3.3.4 Column temperature. 60 ° C.

A.3.3.5 Injection volume. 10 μL.

A.3.4 Analysis steps A.3.4.1 Preparation of standard solutions Accurately weighed 0.25g dried at 105 °C 4h after the erythritol standard, accurate to 0.0001g, transferred to a 50mL

Volumetric flask, with the mobile phase dissolved, diluted volume to the scale, mix and spare. Prior to chromatography, the filter was filtered through a 0.45 µm microporous membrane.

A.3.4.2 Preparation of sample solution Accurately weighed 2.0 g of erythritol samples dried at 105 ° C for 4 h, accurate to 0.0001 g, transferred to a 50 mL capacity Bottle, with the mobile phase dissolved, diluted volume to the scale, mix and spare. Prior to chromatography, the filter was filtered through a 0.45 µm microporous membrane.

A.3.4.3 Determination Under the condition of A.3.3 reference chromatography, the standard solution and the sample solution were chromatographed respectively, and the chromatogram was recorded for 60 min. Erythrocytes the peak time of the sugar alcohol is qualitatively based on the peak time of the standard. Repeat the experiment twice to obtain the average peak area value.

A.3.5 Calculation of results Erythritol content of erythritol (C₄H₁₀O₄) mass fraction w₁, the value in%, according to the formula (A.1).

$$w_1 = m_1 m_2 \times$$

$$100\% \text{ (A.1)}$$

Where.

m₁ --- the value of the quality of the erythritol standard weighed, in grams (g);

m₂ --- the value of the sample to be weighed, in grams (g);

A₁ --- the value of the average peak area of erythritol in the chromatogram of the sample solution;

A₂ - the value of the average peak area of erythritol in the standard solution chromatogram.

The experimental results are based on the arithmetic mean of the parallel measurement results, and the absolute difference between the parallel determination results is not more than 0.5%.

A.4 Determination of burning residue A.4.1 Analysis steps Accurately weighed 2g sample, accurate to 0.0001g, placed at 800 °C ± 25 °C under the burning to constant weight of the crucible, slowly heated until the test Complete carbonization. The carbonized sample was cooled, the residue was wetted with 0.5 mL of sulfuric acid, heated to a sulfuric acid vapor and dried at 800 °C ± 25 °C high temperature furnace burning residue to constant weight.

A.4.2 Result calculation the burning residue is expressed in terms of mass fraction w₂ and the value in%, calculated according to formula (A.2) w₂ = m₄ - m₃ / m × 100% (A.2) where.

m₄ - the mass of the residue and the empty crucible, in grams (g);

m3 --- the value of the quality of the empty crucible in grams (g);

m --- the value of the sample to be weighed, in grams (g).

The experimental results are based on the arithmetic mean of the parallel measurement results, and the absolute difference between the parallel determination results is not more than 0.05%.

A.5 Determination of reducing sugar (in terms of glucose) A.5.1 Reagents and materials

A.5.1.1 Glucose solution. 0.75 mg/mL.

A.5.1.2 Fenlin solution A. Weigh 34.66 g of copper sulfate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$), dissolved in water, completely dissolved, diluted with water to 500 mL, stored in a closed container.

A.5.1.3 Fermentation solution B. Weigh 173 g of potassium tartrate ($\text{KNaC}_4\text{H}_4\text{O}_6 \cdot 4\text{H}_2\text{O}$) and 50 g of sodium hydroxide (NaOH) Water, completely dissolved, diluted with water to 500mL, stored in rubber stopper glass bottle.

A.5.2 Analysis steps Accurately weighed about 0.5g sample, accurate to 0.0001g, transferred to a 20mL flask, add 2mL of water, dissolved, mixed, this as the sample solution. Remove 2 mL of the glucose solution (A.5.1.1) and place in another flask. To each of the two flasks were added 1 mL of fenlin solution Liquid A and 1 mL of Fenlin solution B, heated to boiling and cooled. The solution forms a reddish brown precipitate.

A.5.3 Determination of results If the reaction solution of the glucose solution is cloudy than that of the sample solution, it is judged as qualified.

A.6 Determination of ribitol and glycerol A.6.1 Reagents and materials A.6.1.1 Water. Class III water specified in GB/T 6682-2008.

A.6.1.2 ribose alcohol standards. analytical grade.

A.6.1.3 Glycerol Standard. Analytical purity.

A.6.2 Instruments and equipment High performance liquid chromatograph equipped with a refractive index detector.

A.6.3 Reference chromatographic conditions Standard chromatographic conditions for the determination of erythritol with A.3.3.

A.6.4 Analysis steps A.6.4.1 Preparation of standard solutions Accurately weighed the ribose alcohol standard and glycerol standard 0.025g, accurate to 0.0001g, transferred to a 50mL volumetric flask , With the mobile phase dissolved, diluted volume to the scale, mixed with spare. Prior to chromatography, the filter was filtered through a 0.45 μm microporous membrane.

A.6.4.2 Preparation of sample solution Accurately weighed 2.0 g of erythritol samples dried at 105 ° C for 4 h, accurate to 0.0001 g, transferred to a 50 mL capacity Bottle, with the mobile phase dissolved, diluted volume to the scale, mix and spare. Prior to