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GB 1903.55-2022

National food safety standard - Food nutritional fortification substance - L(+)-Ascorbic acid

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1 Scope

This standard applies to the food nutrition enhancer potassium L-ascorbate prepared from L-Ascorbic acid and potassium bicarbonate or potassium carbonate through a chemical reaction, crystallization, drying, and other processes.

2 Molecular formula, structural formula, and relative

molecular mass

2.1 Molecular formula

C6H7KO6

2.3 Relative molecular mass

214.22 (according to 2018 International Relative Atomic Mass)

3.1 Sensory requirements

Sensory requirements shall meet the requirements in Table 1.

Appendix A Testing method

A.1 General provision Reagents and water used in this standard refer to analytically pure reagents and third-grade water in accordance with GB/T 6682 unless other requirements are indicated.

The standard titration solution, standard solution for impurity determination, preparations, and products used in the test shall be prepared according to the provisions of GB/T 601, GB/T 602, and GB/T 603 unless other requirements are specified. The solution used in the test refers to the aqueous solution when the solvent preparation is not indicated.

A.2 Identification test A.2.1 Solubility

1 g of sample can be dissolved in 2 mL of water.

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A.2.2 Identification A.2.2.1 Method summary The ascorbic acid part in the sample has a dienol group structure, strong reducibility, and the properties of sugars.

A.2.2.2 Reagents and materials A.2.2.2.1 Activated carbon: powder, 75 um ~ 180 um (80 mesh ~ 200 mesh).

A.2.2.2.2 Pyrrole.

A.2.2.2.3 Hydrochloric acid.

A.2.2.2.4 Glacial acetic acid (also known as glacial acetic acid).

A.2.2.2.5 Alkaline cupric tartrate solution.

A.2.2.2.6 Hydrochloric acid solution: 0.1 mol/L. Take 9.0 mL of hydrochloric acid (A.2.2.2.3), add water to dilute to 1000 mL, and shake well to obtain the solution.

A.2.2.2.7 Trichloroacetic acid solution: Take 6 g of trichloroacetic acid, add 25 mL of trichloromethane to dissolve it, add 0.5 mL of 30% hydrogen peroxide solution, and shake well to obtain the solution.

A.2.2.2.8 Sodium tetraphenylborate solution: 1 g/L. Take 0.1 g of sodium tetraphenylborate and dilute it with water to 100 mL.

A.2.2.2.9 Methylene blue indicator solution: Dissolve 5 g of methylene blue in 95% ethanol and dilute to 1000 mL with 95% ethanol.

A.2.2.3 Identification method A.2.2.3.1 The sample solution (20 mg/mL) can reduce the alkaline cupric tartrate solution at room temperature, and the reduction is more rapid when heated.

A.2.2.3.2 Acidify 2 mL of the sample solution (20 mg/mL) with 0.5 mL of the hydrochloric acid solution, add 4 drops of methylene blue indicator solution, warm at 40 °C, and the dark blue color fades within 3 minutes.

A.2.2.3.3 Dissolve 15 mg of the sample with 15 mL of the trichloroacetic acid solution, add about 200 mg of activated carbon, and shake vigorously for 1 min; filter through filter paper until the filtrate is clear, add 1 drop of pyrrole to 5 mL of filtrate, and stir slowly until the pyrrole dissolves; heat it on a water bath at 50 °C to produce a blue color.

A.2.2.3.4 Characteristic reaction that presents the potassium salt A.2.2.3.4.1 Burn the platinum wire impregnated with hydrochloric acid until it becomes colorless on a colorless flame. Dip a little sample and burn it in a colorless flame. The flame is purple when observed through the cobalt glass.

A.2.2.3.4.2 Take the sample, heat and ignite it to remove possible ammonium salts;

after cooling, add water to dissolve, then add sodium tetraphenylborate solution (A.2.2.2.8) and glacial acetic acid (A.2.2.2.4), there shall be a white precipitate formed.

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A.3 Determination of potassium L-ascorbate content (by the dry basis)

A.3.1 Method summary The redox reaction between the sample and the iodine standard titration solution occurs, and the titration end point is judged according to the color of the iodine standard titration solution.

A.3.2 Reagents and materials A.3.2.1 Phosphorus pentoxide.

A.3.2.2 Sulfuric acid solution: Take 57 mL of sulfuric acid, and slowly pour it into an appropriate amount of water; cool to room temperature, add water to dilute to 1000 mL,

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