GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB 1886.210-2016

National food safety standard - Food additives - Propionic acid

食品安全国家标准 食品添加剂 丙酸

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National food safety standard - Food additives - Propionic acid

1 Scope

This standard applies to propionic acid, which is refined by industrial synthesis.

2 Chemical name, molecular formula, structural formula, relative molecular mass

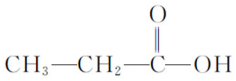
2.1 Chemical name

Propionic acid

2.2 Molecular formula

$C_3H_6O_2$

2.3 Structural formula



2.4 Relative molecular mass

74.08 (according to 2013 international relative atomic mass)

3 Technical requirements

3.1 Sensory requirements

Sensory requirements shall comply with Table 1.

Appendix A

Testing method

A.1 Warning

Some reagents used in the test methods of this standard are toxic or corrosive. Appropriate safety and protective measures shall be taken during operation.

A.2 General provisions

Unless other requirements are specified, the reagents and water used in this standard refer to analytically pure reagents and grade-3 water specified in GB/T 6682. The standard solutions, standard solutions for impurity determination, preparations and products used in the test shall be prepared, in accordance with the provisions of GB/T 601, GB/T 602, GB/T 603, unless other requirements are indicated. The solutions used in the test refer to aqueous solutions, unless the solvent used to prepare them is specified.

A.3 Identification test

Take 1 mL of specimen. Add 3 drops of sulfuric acid and 1 mL of ethanol. Heat it. It shall have an aromatic smell.

A.4 Determination of propionic acid

A.4.1 Reagents and materials

A.4.1.1 Phenolphthalein indicator solution: 1% ethanol solution.

A.4.1.2 Standard titration solution of sodium hydroxide: c (NaOH) = 0.5 mol/L.

A.4.2 Analytical procedures

Weigh 1.5 g of specimen, accurate to 0.0002 g. Put it into a 250 mL conical flask. Add 100 mL of newly boiled and cooled water. Add 2 drops of phenolphthalein indicator. Use sodium hydroxide standard titration solution to titrate, until red color does not fade for 30 s, which is taken as the end point.

A.4.3 Result calculation

The mass fraction w_1 of propionic acid content is calculated according to formula (A.1):

$$w_1 = \frac{c \times V \times M}{m \times 1\,000} \times 100\% \qquad \cdots\cdots (A.1)$$

Where:

V_0 - The volume of iodine standard titration solution, which is consumed during the blank test, in milliliters (mL);

V_1 - The volume of iodine standard titration solution, which is consumed when measuring the aldehyde content in the specimen, in milliliters (mL);

M - The molar mass of propionaldehyde, in grams per mole (g/mol) [M (C_3H_6O) = 58.08];

m - The mass of the specimen, in grams (g);

1000 - Conversion factor;

2 - Molar conversion factor.

The test results are based on the arithmetic mean of parallel measurement results (retaining 3 decimal places). The absolute difference between two independent determination results, which are obtained under repeatability conditions, is not greater than 10% of the arithmetic mean.

A.6 Determination of easy oxidants (calculated as formic acid)

A.6.1 Reagents and materials

A.6.1.1 Sodium hydroxide.

A.6.1.2 Bromine.

A.6.1.3 Sodium acetate solution: 200 g/L.

A.6.1.4 Potassium iodide solution: 250 g/L.

A.6.1.5 Hydrochloric acid.

A.6.1.6 Sodium thiosulfate standard titration solution: c ($Na_2S_2O_3$) = 0.1 mol/L.

A.6.2 Analytical procedures

Dissolve 15 g of sodium hydroxide in 50 mL water. Cool it. Add 6 mL of bromine. Stir thoroughly to dissolve completely. Use water to dilute to 2000 mL. Take 25.0 mL of this solution and place it in a 250 mL stoppered conical flask, which contains 100 mL of water. Add 10 mL of sodium acetate solution and 10 g of specimen (accurate to 0.001 g). Leave it for 15 minutes. Add 5 mL of potassium iodide and 10 mL of hydrochloric acid. Use sodium thiosulfate standard titration solution to make titration, until the brown color disappears. Do a blank test at the same time.

A.6.3 Result calculation

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