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# 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<sub>1</sub> of propionic acid content is calculated according to formula (A.1):

$$w_1 = \frac{c \times V \times M}{m \times 1000} \times 100\% \qquad \dots$$
 (A.1)

Where:

- $V_0$  The volume of iodine standard titration solution, which is consumed during the blank test, in milliliters (mL);
- V<sub>1</sub> 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 propional dehyde, 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:  $c (Na_2S_2O_3) = 0.1 \text{ mol/L}.$

### 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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