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

GB 28305-2012

**National food safety standards -- Food additives -- Potassium
lactate**

食品添加剂 乳酸钾

(English Translation)

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Table of Contents

- 1 Scope
- 2 Chemical name, structural formula, molecular formula, relative molecular mass
 - 2.1 Chemical name
 - 2.2 Structural formula
 - 2.3 Molecular formula
 - 2.4 Relative molecular mass
- 3 Technical requirements

1 Scope

This standard applies to the production of lactic acid and potassium hydroxide produced by the reaction of food additives made of potassium lactate.

2.1 Chemical name

Potassium 2-hydroxypropionate

2.3 Molecular formula

C₃H₅KO₃

2.4 Relative molecular mass

128.17 (according to the 2007 international relative atomic weight)

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 Colorless or yellowish color Odorless or characteristic odor State micro viscous clear liquid Take appropriate sample in a clean, dry glass beaker, in the natural light, observe the color and state, and smell 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 Potassium lactate content, w /% ≥ 50.0 a Appendix A, A.3 Color/(Black) ≤ 100 GB/T 605 pH 5.0 to 9.0 Appendix A, A.4 Chloride passed the test Appendix A, A.5 Heavy metals (Pb)/(mg/kg) ≤ 20 GB/T 5009.74 Lead (Pb)/(mg/kg) ≤ 2 GB 5009.12 Sulfate through Test Appendix A, A.6 Sodium, w /% ≤ 0.1 GB/T 5009.91 Cyanide through Test Appendix A, A.7 Methanol and methyl ester were tested in Appendix A, A.8 Citrate, oxalate, phosphate or tartrate through Test Appendix A, A.9 the reducing sugar is passed through Test Appendix A. A.10 a The actual detection value is 98.0% ~ 102.0% of the label identification value.

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 Reagents and materials A.2.1.1 hydrochloric acid solution. 0.1mol/L.

A.2.1.2 sulfuric acid solution. 1mL sulfuric acid and 19mL water prepared.

A.2.1.3 potassium permanganate test solution. 0.1mol/L.

A.2.1.4 Morpholine solution. 1 4.

A.2.1.5 Sodium nitrite ferricyanide solution. 50 g/L.

A.2.2 Analysis steps A.2.2.1 identification of potassium. take platinum wire, with hydrochloric acid solution wet, dipped in the sample, in the colorless flame burning, the flame that was purple; but there are A small amount of sodium salt mixed, must be separated from the blue glass perspective can be identified.

A.2.2.2 identification of lactate. take 5mL sample, add 2mL sulfuric acid solution mix, plus 2mL potassium permanganate test solution, heating, should There is acetal gas generated. Acetaldehyde gas identification using an equal volume of morphine solution and nitrosyl ferricyanide test solution mixture wet Filter paper, filter paper and gas contact with blue.

A.3 Determination of potassium lactate content A.3.1 Reagents and materials A.3.1.1 Acetic anhydride.

A.3.1.2 Glacial acetic acid.

A.3.1.3 Standard titration solution for perchloric acid. $c(\text{HClO}_4) = 0.1 \text{ mol/L}$.

A.3.1.4 Crystal violet indicator solution. 5g/L.

A.3.2 Analysis steps A.3.2.1 Potentiometric titration Weigh the equivalent of about 300mg of potassium lactate liquid sample, accurate to 0.0001g, add 10mL acetic anhydride and 50mL ice Acetic acid, mixed evenly, put it aside for about 20min, with potentiometric titration to titration with perchloric acid standard titration, the same method to do blank titration.

A.3.2.2 Manual titration method Weigh the equivalent of about 300mg of potassium lactate liquid sample, accurate to 0.0001g, add 10mL acetic anhydride and 50mL ice Acetic acid, mixed evenly, put it aside for about 20min, add 1 drop of crystal violet indicator solution, titration with perchloric acid standard titration, to the solution was blue Color, 30s does not fade, that is, the end of the titration, while the blank test to correct the results of titration.

A.3.3 Calculation of results the potassium lactate content is expressed as the mass fraction w_1 of potassium lactate ($C_3H_5KO_3$), expressed in%, calculated according to the formula (A.1) $w_1 = (V_1 - V_0) \times c \times 0.1282 \times 100\%$ (A.1) where.

V_1 --- sample titration consumption perchloric acid standard titration solution volume value in milliliters (mL);

V_0 --- blank titration consumption perchloric acid standard titration solution volume value in milliliters (mL);

c - the actual concentration of perchloric acid standard titration solution in moles per liter (mol/L);

0.1282 --- The molar mass of potassium lactate ($C_3H_5KO_3$) in grams per mole (g/mmol) [$M(C_3H_5KO_3) = 128.2$];

m - the mass of the sample, in grams (g).

The experimental results are based on the arithmetic mean of the parallel measurement results. The absolute difference between the parallel determination results shall not exceed 0.5%.

A.4 Determination of pH Take 1 part of the sample, add 5 copies of equal volume of water, prepared into the test solution (15), shake and then measured with a pH meter.

A.5 Determination of chloride A.5.1 Reagents and materials A.5.1.1 Chloride standard solution. 0.1 mg/mL. When used, the standard solution was diluted 10 times to a chloride (Cl) concentration of 0.01 mg/mL.

A.5.1.2 Nitric acid solution. 1 2.

A.5.1.3 Silver nitrate solution. 17 g/L.

A.5.2 Analysis steps Weigh about 1g sample, accurate to 0.01g, dissolved in water, transferred to 50mL volumetric flask, add water to the volume, shake. quasi-Really take 5mL of this sample solution, placed in 50mL colorimetric tube, add water to about 35mL, add 10mL nitric acid solution, plus 1mL nitric acid Silver solution, diluted with water to

50mL, shake, placed in the dark 5min, placed on a black background, compared with the standard tube, the turbidity should not be deep Standard tube, that is, through the test.

Standard tube preparation. accurate extraction of 5mL diluted 10 times after the chloride standard solution and sample tube at the same time the same treatment.

A.6 Determination of Sulfate A.6.1 Reagents and materials A.6.1.1 hydrochloric acid solution. 3mol/L.

A.6.1.2 barium chloride solution. 250 g/L.

A.6.1.3 Sulfate standard solution. 0.1 mg/mL.

A.6.2 Analysis steps Weigh 2g sample, accurate to 0.01g, placed in 50mL colorimetric tube, add appropriate amount of water, add hydrochloric acid to make neutral, continue to add water diluted to About 40mL, add 2mL hydrochloric acid solution, shake, add 5mL barium chloride solution, diluted with water to 50mL, shake well, place 10min, set on a black background, compared with the standard tube, the turbidity should not be deeper than the standard tube, that is, through the test.

Standard tube preparation. Accurately absorb 1mL sulfate standard solution and sample tube at the same time the same treatment.

Determination of cyanide Note. Potassium cyanide is highly toxic. This test should be carried out carefully in a fume hood to prevent skin contact, inhalation of solution and steam.

A.7.1 Reagents and materials A.7.1.1 p-phenylenediamine hydrochloride.

A.7.1.2 Pyridine.

A.7.1.3 Hydrochloric acid.

A.7.1.4 Potassium cyanide.

A.7.1.5 n-butanol.

A.7.1.6 Sodium hydroxide solution. 0.1 mol/L.

A.7.1.7 Sodium hydroxide solution. 20 g/L.

A.7.1.8 Phosphoric acid solution. 5 g/L.

A.7.1.9 sodium arsenite solution. 20 g/L.

A.7.1.10 bromine reagent. 100g/L, weighed 10g bromine, set with Vaseline coated glass bottle, add water shake shake to volume to 100mL.

The liquid should be kept in dark places.

A.7.2 Instruments and equipment Spectrophotometer.