



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

GB 1886.173-2016

Replacing GB 2023-2003

Food additive -- Lactic acid

食品安全国家标准 食品添加剂 乳酸

(English Translation)

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Table of Contents

Foreword

1 Scope

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

2.1 Chemical Name

2.2 Formula

2.4 Relative molecular mass

3 Technical requirements

3.1 Sensory requirements

3.2 Physical and Chemical Indicators

Foreword

This standard replaces GB 2023-2003 "food additive lactic acid." this standard compared with GB 2023-2003, the main changes are as follows.

--- Modify the sensory requirements;

--- Modify the content of lactic acid, L- lactic acid content of total cyanide indicator;

--- Remove the color, solubility ether, methanol (CH_3OH in dollars), calcium, heavy metals (Pb) of the indicator;

--- Increased the lead index requirements and test methods;

--- Modify the identification test, lactic acid content, residue on ignition, citric acid, oxalic acid, phosphoric acid, tartaric acid testing methods;

--- Reference standard test methods section is adjusted to the latest released version.

National Food Safety Standard Food Additives Lactic Acid

1 Scope

This standard applies to starch or sugar as raw material quality, the use of lactic acid bacteria or *Rhizopus oryzae* fermentation of prepared food additive lactic acid.

2.1 Chemical Name

alpha- hydroxy acid

2.2 Formula

Formula 2.3

C₃H₆O₃

2.4 Relative molecular mass

90.08 (according to 2011 international relative atomic mass)

3.1 Sensory requirements

Sensory requirements shall comply with the requirements of Table 1.

Table 1 Sensory requirements

Project requires test methods Colorless to pale yellow color white to pale yellow State clear liquid crystalline grain Smell no odor or slight characteristic odor Take the right amount of liquid sample and a solid sample is placed in a clean, dry Beaker or porcelain plate, observe its color under natural light Chak and status, and to smell the odor

3.2 Physical and Chemical Indicators

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

Table 2. Physical and chemical indicators

Item Index Test Method 95.0 to 105.0 Appendix A lactate concentration, w /% of the value declared in A.3 L- lactic total lactic acid content, w /% ≥ 97 Appendix A A.4 Residue on ignition, w /% ≤ 0.1 A.5 in Appendix A Chloride (Cl dollars), w /% ≤ 0.002 A.6 in Appendix A Sulfate (SO₄ dollars), w /% ≤ 0.005 Appendix A A.7 Iron salts (as Fe), w /% ≤ 0.001 Appendix A A.8 Cyanide/(mg/kg) ≤ 1 Appendix A A.9 Citric acid, oxalic acid, phosphoric acid, tartaric acid by Appendix A test A.10 by reducing sugar test A.11 in Appendix A Easy carbon compound by test A.12 in Appendix A Lead (Pb)/(mg/kg) ≤ 2.0 GB 5009.75 or GB 5009.12 Arsenic (As)/(mg/kg) ≤ 1.0 GB 5009.76 Appendix A Testing method A.1 General Provisions at the time of the reagents and the water did not specify other requirements, refer to the three water analytical reagent and GB/T 6682 regulations. Test when used in the standard solution, standard solution for measuring impurities, formulations and products not specified in other requirements, according to GB/T 601, GB/T 602, GB/T 603 provisions prepared. Solution was used in the tests did not indicate what is formulated with solvent, it refers to an aqueous solution.

A.2 Identification Test A.2.1 Acid Test 10% aqueous sample of litmus paper acidic.

A.2.2 lactate test

The solid sample is dissolved in an appropriate amount of water or take a liquid sample,

plus 10mL 0.1mol/L potassium permanganate solution/heating, which produce acetaldehyde it smells.

A.3 Determination of lactic acid A.3.1 Reagents and materials A.3.1.1 sodium hydroxide solution. 40g/L.

A.3.1.2 sulfuric acid standard titration solution. $c(1/2H_2SO_4) = 0.5mol/L$.

A.3.1.3 phenolphthalein indicator solution. 10g/L.

A.3.2 Analysis step

Weigh the sample 1g (accurate to 0.0002g), add 50mL water, adding sodium hydroxide solution accurately 20mL, boiled for 5min, add phenolphthalein Indicator solution 2 drops hot with 0.5mol/L sulfuric acid standard titration solution titration, while for the blank test.

A.3.3 Calculation Results Lactic acid content mass fraction w_1 , according to equation (A.1) Calculated.

$(V_0 - V_1) \times c \times M$

$1000 \times m \times$

100% (A.1)

Where.

V_0 --- volume of sulfuric acid standard titration solution consumed in the blank titration solution in milliliters (mL);

Volume V_1 --- sulfate standard titration solution consumed by the sample solution, in milliliters (mL);

C --- the actual concentration of sulfuric acid standard titration solution, expressed in moles per liter (mol/L);

--- The M molar mass of lactic acid units of grams per mole (g/mol) [$M(C_3H_6O_3) = 90.08$];

1000 --- quality conversion factor;

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

The results parallel arithmetic mean of the measurement results shall prevail. Twice under the same condition of independent determination results obtained absolute difference not more than 0.2%.

Determination of total lactic acid A.4 L- lactic acid A.4.1 Reagents and materials GB/T 6682 provided a water.

A.4.2 Instruments and Equipment High performance liquid chromatography.

A.4.3 reference chromatographic conditions A.4.3.1 Column. with an optically active ligand

exchange-type stationary phase coated or bonded to the silica filler column ($\phi 4.6\text{mm} \times 15\text{cm}$), or other equivalent column.

A.4.3.2 Mobile phase. 0.5g/L copper sulfate solution.

A.4.3.3 detection wavelength. 254nm.

A.4.3.4 Column temperature. 35 °C.

A.4.3.5 flow rate. 0.5mL/min.

A.4.3.6 Injection volume. 20 μL .

A.4.3.7 separation requirements. D-type and L-type separation ≥ 1.0 .

A.4.4 Analysis step

Weigh the sample 0.05g (accurate to 0.0001g), add water or mobile phase and dilute to volume to 100mL, before chromatographic analysis using 0.45 μm micro Hole membrane filter. A.4.3 under chromatographic conditions were determined with reference, to give analysis sample peak area D- and L- lactic acid (D- milk Acid retention time is about 10min, L- lactic acid retention time of about 12min), by area normalized and quantified.

A.4.5 Calculation Results L- lactic acid, lactic acid levels of total mass fraction w_2 , according to equation (A.2) Calculated.

AL AD x

100% (A.2)

Where.

AL --- sample L- lactic acid peak area;

AD --- sample D- lactic acid peak area.

The results parallel arithmetic mean of the measurement results shall prevail. Twice under the same condition of independent determination results obtained absolute difference not more than 0.2%.

A.5 Determination of residue on ignition A.5.1 Reagents and materials sulfuric acid.

A.5.2 Instruments and Equipment A.5.2.1 crucible.

A.5.2.2 high-temperature furnace.

A.5.2.3 dryer.

A.5.3 Analysis step

Take a sample of about 2g (accurate to 0.0001g), into the ignition to constant weight has been a crucible in the furnace slowly burn to completely carbonized, cold to room temperature. Add about 0.5mL sulfuric moist, low-temperature heating to sulfuric acid vapor