



昊禾生物

HAOHE BIOTECH

COMPANY PROFILE



目录

CATALOGUE

About us 01

Product Introduction 02

Application field 03

Quality and characteristics
of L-malic acid 04

Other Products 08

About us



Haohe Biotechnology (Changzhou) Co., Ltd. (hereinafter referred to as Haohe Biotech), which traces its roots back to Nanjing Haohe Biotechnology Co., LTD. was founded on May 2021. At the beginning of its founding, the company has received investments of millions of yuan from Singaporean angel investor. In May 2024, China State Investment High-tech Industry Investment Co., LTD. (referred to as SDIC High-tech) made industrial investment in our company, and the project is the first incubated technology enterprise invested by SDIC High-tech.

Haohe Biotech adheres to the concept of natural, healthy and low-carbon, and is committed to the development of products with high natural degree, high optical purity and high chemical purity. It has core technologies such as microbial strain selection and fermentation precision regulation, and has established a green biological manufacturing technology system such as a variety of bulk chemicals and fine chemicals. The company has realized one-step fermentation production of L-malic acid with renewable sugar as raw material, and obtained high quality products; The product matrix with L-malic acid as the core platform compound is developed, and its application in food, medicine, electronics, chemical industry and other fields.



1.ProductIntroduction

CAS:97-67-6

Product Name

Chinese Name: L-苹果酸

English Name: L-Malic acid

Chemical Name: 2-Hydroxybutanedioic Acid

Molecular Structure

Molecular Formula: $C_4H_6O_5$

Molecular Weight: 134.09 (According to relative atomic masses evaluated in 2007)

Product Specifications

Melting Point: 101-103°C

Characteristics: Hygroscopic

Odor: Has a distinctive sour smell

Solubility: Freely soluble in water and ethanol, with a solubility in water of 67g/100mL at 20°C

Appearance and Form: White crystals or crystalline

powder

Production Method

Microbial Fermentation Method: L-Malic Acid, eco-friendly and safe, with high product purity and no D-form

Haohe Biotech L-malic acid is produced by fermentation with renewable sugar as raw material, and the product has the characteristics of high natural degree, high optical purity and high chemical purity.



2. Applicationfield

01 In Food Industry



Adjusts acidity. Stimulates the formation of gels and conducive to the preservation and disinfection of foods. Participates in metabolism and rapidly recovers energy with anti-fatigue and salt-reducing effects.

02 In Pharmaceutical industry



Used as raw material or excipient to enhance drug stability. Promotes drug absorption and diffusion. Has protective effects on the liver and kidneys.

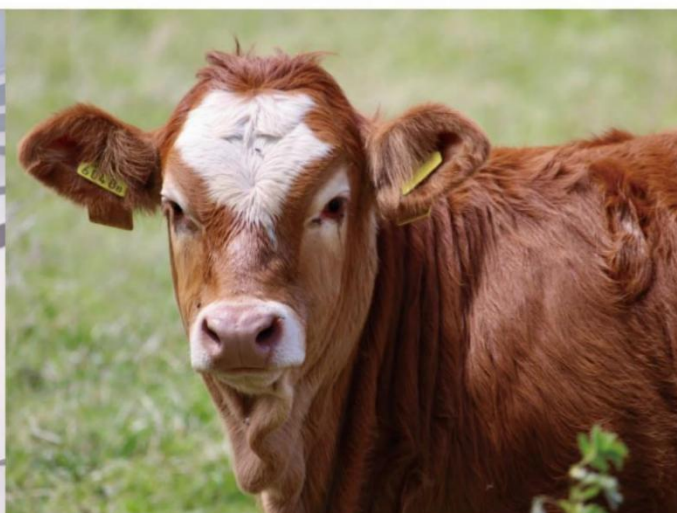
03 In Consumer-goods Industry



Adjusts pH levels and maintains stability of products.

Relieves skin issues.

04 In Feed Industry



Improves feed palatability and enhances gut health.

3.QUALITYAND CHARACTERISTICS OFL-MALICACID

01 L-Malic Acid Quality Inspection

INSPECTIONANDTESTINGRESULTS

TITLE OF INDEX	INDEX	TEST METHOD
APPEARANCE	White Crystal or Crystalline Powder	GB1886.40-2025
ASSAY (AS $C_4H_6O_5$)	≥ 99.0	GB1886.40-2025
SPECIFIC ROTATION $[a]_D^{20^\circ C}$	$-1.6^\circ \sim -2.6^\circ$	GB1886.40-2025
ARSENIC $[As_2O_3]$ mg/kg	≤ 2.0	GB1886.40-2025
HEAVY METALS $[Pb]$ mg/kg	≤ 10	GB1886.40-2025
RESIDUE ON IGNITION %	≤ 0.10	GB1886.40-2025
CHLORIDE $[Cl]$ %	≤ 0.004	GB1886.40-2025
SULFATE $[SO_4]$ %	≤ 0.02	GB1886.40-2025
FUMARIC ACID %	≤ 0.5	GB1886.40-2025
MALEIC ACID %	≤ 0.05	GB1886.40-2025
STATE OF SOLUTION	PASS	GB1886.40-2025
LEAD Pb mg/kg	≤ 2	GB1886.40-2025
CONCLUSION:	PASS	

Basis for inspection: GB 1886.40-2025

Basis for judgment: GB 1886.40-2025

Test and Inspection Conclusion: After rigorous testing and inspection, it has been confirmed that the Haohe L-Malic Acid has fully met the requirements of the standards for all tested items, with a purity level as high as 99.5%.


中析研究所
 分析 · 研发 · 检测

 Beijing ZKGX Institute of Science and Technology
 Beijing ZKGX Institute of Science and Technology Shandong Branch

Report ID: ZX250326-C210301

Date: APR.08, 2025

Page 2 of 4



Research Test Report

Research test results: Testing Special Chap

Sample Name and NO.	Test Item	Test Result
L-Malic acid /ZX250326-C210301	Naturalness test	After measurement, the ¹⁴ C specific activity of the sample is 12.19 DPM/g.C; According to the modern carbon standard of 13.6DPM/g.C, The naturalness of the sample is 94.1%

Reference standard: ASTM D6866-20

Testing instrument: 1. Ultra low background liquid scintillation tester; 2. Parr oxygen bomb combustion device; 3. Analytical balance; 4. Vacuum pump, oxygen cylinder, glassware

Test environment: temperature 25 °C, relative humidity 30% RH

Note: This report is a research and testing report, only applicable for product quality control and R&D data reference, and cannot be used for rights protection, disputes, and judicial purposes. The test results only represent the samples submitted for inspection and are not responsible for the batch represented by the submitted samples.

End of Report --This Page

3. L-QUALITYAND CHARACTERISTICSOFL-MALIC ACID

03 L-Optical Purity Analysisof L-Malic Acid

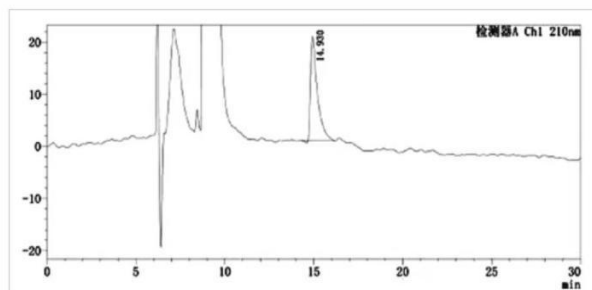


Figure1:Chromatogram of D-Malic Acid Standard

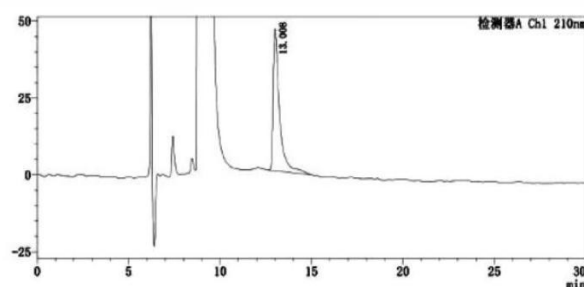


Figure 2: Chromatogram of L-Malic Acid Standard

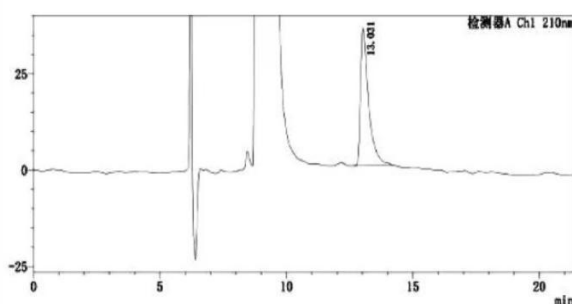


Figure 3: Chromatogram of Haohe Biotech's L-Malic Acid

Result Analysis: The peak time of Haohe L-malic acid product was consistent with the L-malic acid standard, and no D-malic acid peak was found in the sample, so it could be determined that Haohe Biotech L-malic acid was L-malic acid with high optical purity.

04 Production Process

	1950s	1960s	in recent years
Production Method	enzymatic method	chemical synthesis method	biological fermentation method
Main Raw Materials	benzene, fumaric acid	maleic anhydride	glucose
Product	L-MALIC ACID	DL-MALIC ACID	L-MALIC ACID
Comparison	resource shortage	environmental pollution	safe and green

Haohe Biotech L-malic acid is produced by fermentation with renewable sugar as raw material, and the product has the characteristics of high natural degree, high optical purity and high chemical purity.

05 Safety

L-Malic Acid, an intermediate in the tricarboxylic acid cycle of living organisms, is directly absorbed by the body without damaging the mouth or teeth. It facilitates the absorption of amino acids and does not promote fat accumulation, earning it the reputation as the most ideal food acidulant.

The Food and Agriculture Organization (FAO) of the United Nations and the World Health Organization (WHO) have stipulated that only L-Malic Acid can be added as an acidulant in infant foods.

4.other Products

Other Products	CAS号	Molecular Formula	外观
Calcium L-malate	17482-42-7	$C_4H_4CaO_5$	white crystal or crystalline powder
Sodium L-malate	68303-40-2	$C_4H_4Na_2O_5 \cdot H_2O$	white crystal or crystalline powder
Zinc L-malate	2847/5/4	$C_4H_4O_5Zn$	White powder
Potassium L-malate	585-09-1	$C_4H_5KO_5$	white crystal or crystalline powder
Magnesium L-malate	869-06-7	$C_4H_6MgO_6$	White crystalline powder

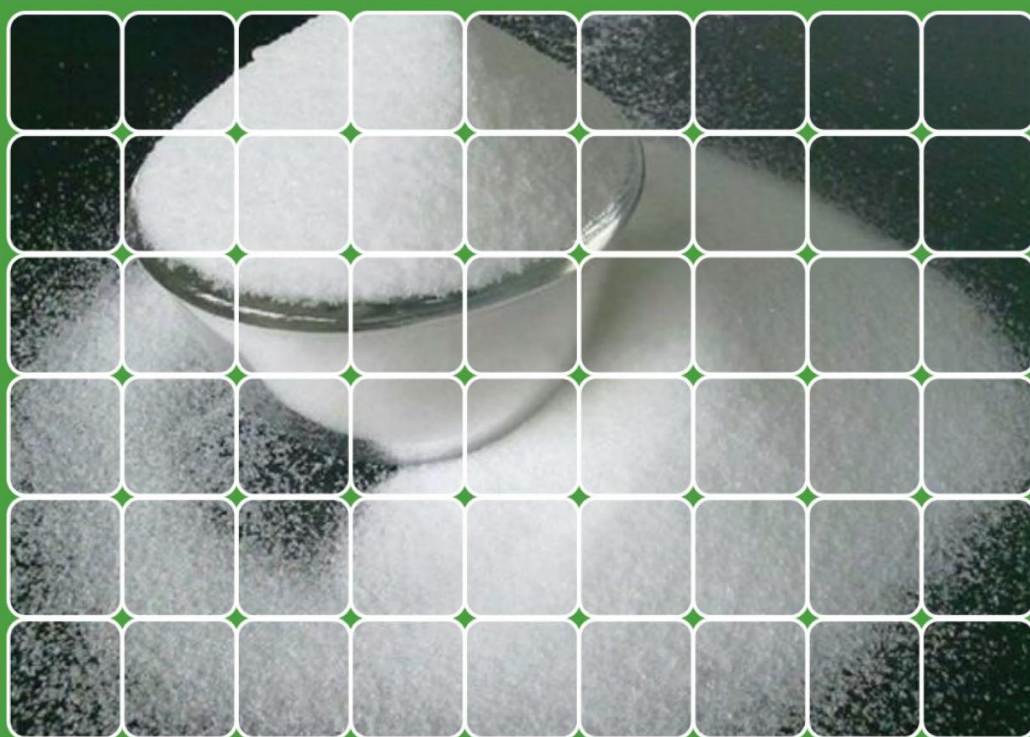
L-malic acid is an optical isomer of malic acid and has the same physical and chemical properties asDL-malic acid except for optical activity, and L-malic acid has the ability to directly participate in the metabolism of organisms.

According to the United Nations Committee on Food Additives (JECFA), the ADI value (allowable daily intake) of L-malic acid is not specified, indicating that it is safe under normal use. However, long-term excessive intake or inappropriate use may bring some side effects, such as indigestion, diarrhea, etc. Therefore, when using L-malic acid, the relevant safety standards and regulations should be followed, and excessive intake should be avoided.



OUR WOTKSHOP





Haohe Biotechnology (Changzhou) Co., Ltd

TEL:0519-88318606

Add: Building B3, Hengtai First Industrial Park, No.1 Hanshan Road,
Changzhou , Jiangsu Province, China