Safety Data Sheet (MSDS)

(According to GB/T 16483 and GB/T 17519; Adapts to GHS, IMDG, IATA Standards)**Product Name:** Citric Acid (Food Grade, Anhydrous)**Revision Date:** 26 FEB 2026

SECTION 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product Identifiers

- Product Name: Citric Acid (Food Grade, Anhydrous)
- Product Number: CIT-20260228
- Brand: SIGALD
- CAS-No.: 77-92-9
- Synonyms: 2-Hydroxy-1,2,3-propanetricarboxylic acid; Food Grade Citric Acid; 柠檬酸

1.2 Details of the supplier

- Company: NEWAY SINOPHC TECH. LIMITED
- Address: RM. 204, BUILDING 3, NO. 188, AONA RD., CHINA (SHANGHAI) PILOT FREE TRADE ZONE.
- Telephone: +86-021-50350029
- Fax: +86-021-50350029

1.3 Emergency telephone

Emergency Phone #: +86-021-50350029 (CHEMTREC)

1.4 Relevant Identified Uses and Uses Advised Against

- **Identified Uses**: Food additive (acidulant, flavor enhancer, preservative, chelating agent, pH regulator); raw material for beverage, bakery, confectionery, dairy, meat products, seasoning; pharmaceutical excipient, cosmetic raw material.
- **Uses Advised Against**: Avoid excessive contact with mucous membranes in high concentration; no use in strong alkaline food systems without pH adjustment.

SECTION 2: Hazards Identification

|Summary of Emergency Measures|White free-flowing crystalline powder, odorless, sour taste. Mild irritant in high concentration. After inhalation: Move to fresh air if coughing/irritation occurs. In case of skin contact: Rinse with plenty of water; mild dryness/irritation may occur in sensitive individuals. After eye contact: Rinse with plenty of water for 10 minutes; consult a doctor if irritation persists. After swallowing: Rinse mouth with water, drink milk; mild gastrointestinal discomfort may occur with excessive ingestion. Non-combustible. No explosion risk.| |---|

2.1 GHS Classification

Skin Irritation (Category 2); Eye Irritation (Category 2)

2.2 GHS Label Elements

- Hazard Pictogram: (Warning)
- Signal Word: **Warning**
- Hazard Statements: H315 (Causes skin irritation); H319 (Causes serious eye irritation)

- Precautionary Statements: P264, P280, P302+P352, P305+P351+P338, P321, P332+P313, P337+P313

2.3 Physical and Chemical Hazards

Based on current information: No physical/chemical hazards under normal use; non-combustible, non-explosive; slightly hygroscopic; stable under normal storage conditions.

2.4 Health Hazards

Mild skin/eye irritation in direct high-concentration contact; mild gastrointestinal discomfort with excessive oral ingestion; no acute/chronic toxic effects at standard food additive dosages; no sensitization, mutagenicity or carcinogenicity; naturally present in human body as a metabolic intermediate.

2.5 Environmental Hazards

Based on current information: Environmentally friendly; fully biodegradable; no adverse effects on aquatic/terrestrial organisms; no bioaccumulation potential; no eutrophication risk.

2.6 Other Hazards

No additional hazards identified; fine powder may cause slippery surfaces on hard floors after spillage.

SECTION 3: Composition/Information on Ingredients

- **Substance / Mixture**: Pure chemical substance (food-grade tricarboxylic acid)

3.1 Main Components

Component	Citric Acid (Anhydrous)
Formula	$C_6H_8O_7$
Molecular Weight	192.12 g/mol
CAS-No.	77-92-9
Concentration (w/w)	≥ 99.5%

Hazardous Ingredients

Component	Classification	Concentration (w/w)
Citric Acid (Food Grade)	Skin Irrit. 2, Eye Irrit. 2	≥99.5%
Food-Grade Anticaking Agent (Silicon Dioxide)	Non-hazardous	≤0.3%
Deionized Water (trace)	Non-hazardous	≤0.2%
Total Hazardous Ingredients	Citric Acid	≥99.5%

SECTION 4: First Aid Measures

4.1 Description of First-Aid Measures

- **If Inhaled**: Move victim to fresh air and keep at rest in a comfortable breathing position. Rinse mouth with water; consult a doctor if coughing/chest discomfort persists.
- **In Case of Skin Contact**: Rinse skin thoroughly with running water for 10-15 minutes. Remove contaminated clothing and wash before reuse. Apply mild moisturizer if dryness/irritation occurs; consult a doctor if symptoms persist.

- **In Case of Eye Contact**: Rinse eyes cautiously with plenty of running water for 10 minutes (hold eyes open while rinsing). Remove contact lenses if present and easy to do. Consult a doctor immediately if irritation, redness or blurred vision occurs.
- **If Swallowed**: Rinse mouth with water and drink 1-2 cups of milk or water to dilute. Do not induce vomiting. Consult a doctor if gastrointestinal discomfort (nausea, stomachache) occurs.

4.2 Most Important Symptoms and Effects

- **Acute Effects**: Mild skin/eye irritation (redness, dryness); mild gastrointestinal discomfort with excessive ingestion; no other acute toxic effects.
- **Delayed Effects**: No known delayed toxic effects based on long-term food and industrial use data.

4.3 Indication of Any Immediate Medical Attention

Seek medical attention immediately for eye contact and persistent skin/gastrointestinal irritation.

4.4 Notes to Physician

Inform the physician of the product composition (food-grade Citric Acid, tricarboxylic acid) and exposure route if medical consultation is required.

SECTION 5: Firefighting Measures

5.1 Extinguishing Media

- **Suitable**: Water spray, foam, carbon dioxide (CO_2), dry chemical powder.
- **Unsuitable**: No limitations of extinguishing agents.

5.2 Special Hazards Arising from the Substance

Non-combustible; decomposes at extreme high temperature (>300℃) to produce non-toxic carbon dioxide and water; no hazardous combustion gases generated under normal fire conditions.

5.3 Advice for Firefighters

Wear standard fire-fighting protective gear (gloves, goggles, dust respirator); avoid inhalation of thermal decomposition dust in large-scale fire; fight fire from a safe distance.

SECTION 6: Accidental Release Measures

6.1 Personal Precautions

Wear nitrile rubber gloves, safety goggles and FFP1 dust mask for all spills; ensure good ventilation at the spill site; wear non-slip shoes as powder may cause slippery surfaces.

6.2 Environmental Precautions

No special environmental precautions; the product is biodegradable and non-polluting; sweep up spilled powder to avoid direct entry into water bodies (no environmental risk if entered).

6.3 Methods for Containment and Cleaning Up

- **Small Spill**: Gently sweep up the powder with a brush and collect in a sealed plastic container for reuse/disposal; wipe the floor with a damp cloth to remove residual powder and prevent slipping.
- **Large Spill**: Contain with plastic barriers to prevent powder spread; transfer to sealed HDPE drums for recycling or disposal; clean the contaminated area with a damp mop and dry thoroughly.

6.4 Reference

For disposal, see Section 13.

SECTION 7: Handling and Storage

7.1 Precautions for Safe Handling

- Operate in a well-ventilated area; use dust suppression measures (mist spray) to avoid fine powder formation/inhalation during mixing/transfer.
- Avoid direct contact with skin, eyes and mucous membranes; wear PPE for bulk handling.
- Avoid contact with strong alkalis, strong oxidizing agents and high temperature (>200℃) to prevent neutralization/decomposition.
- **Hygiene Measures**: Wash hands thoroughly with soap and water after handling; do not eat/drink/smoke while operating the product (follow food hygiene operation standards); avoid touching eyes/mucous membranes after handling.

7.2 Conditions for Safe Storage

- **Storage Conditions**: Store in a cool, dry, well-ventilated warehouse; keep container tightly sealed to prevent moisture absorption, caking and contamination; storage temperature ≤ 25℃, relative humidity ≤ 60%.
- **Incompatibilities**: Strong alkalis (NaOH, KOH), strong oxidizing agents (hydrogen peroxide, chlorine-based disinfectants), concentrated ammonia water, alkaline food additives.
- **Storage Class (TRGS 510)**: 13 (Non-Hazardous Solids)
- **Shelf Life**: 36 months (unopened, under specified storage conditions); 12 months after opening (seal tightly, store in dry environment).

SECTION 8: Exposure Controls/Personal Protection

8.1 Control Parameters

- Occupational Exposure Limit (OEL): TWA 10 mg/m³ (respirable dust); STEL 20 mg/m³
- ACGIH TLV: TWA 10 mg/m³ (total dust)

8.2 Exposure Controls

- **Engineering Controls**: Local exhaust ventilation (LEV) for large-scale processing; dust collection system to reduce airborne powder concentration; dehumidification equipment to maintain low humidity in storage/processing area.
- **Personal Protective Equipment (PPE)**:
  - Eye/Face Protection: Safety goggles with side shields (mandatory for all handling operations) to prevent powder splashing into eyes.

- Skin Protection: Nitrile rubber gloves (food grade, thickness ≥0.11 mm) and clean protective clothing for all handling; impermeable gloves for bulk mixing.
- Respiratory Protection: FFP1 dust mask for regular bulk handling; FFP2 mask for large-scale spill or fine dust generation.
- Foot Protection: Non-slip food-grade safety shoes for all handling operations to avoid slipping on spilled powder.
- Hygiene: Provide food-grade hand washing facilities with pure water and soap at the workplace; emergency eye wash station for bulk processing area.

SECTION 9: Physical and Chemical Properties

a) Physical State: Crystalline powderb) Color: White to off-whitec) Odor: Odorlessd) Taste: Sour (strong)e) Melting Point: 153-159℃f) Boiling Point: 310℃ (decomposes)g) Flammability: Non-combustibleh) Flammability Limits: Not applicablei) Flash Point: > 150℃ (Closed Cup)jj) Autoignition Temperature: > 400℃k) Decomposition Temperature: ≥ 200℃l) pH Value (25℃, 1% aqueous solution): 2.0-2.5m) Viscosity: N/A (solid); 5-8 mPa·s (10% aqueous solution, 25℃)n) Solubility: Freely soluble in water (≈590 g/L at 25℃); soluble in ethanol/acetone; slightly soluble in ethero) Partition Coefficient (log Kow): -1.64 (hydrophilic)p) Vapor Pressure (25℃): Negligible (< 0.0001 hPa)q) Density (25℃, solid): 1.665 g/cm³r) Bulk Density: 0.7-1.0 g/cm³s) Hygroscopy: Slightly hygroscopict) Explosive Properties: Not explosiveu) Oxidizing Properties: Nonev) Reducing Properties: None

SECTION 10: Stability and Reactivity

10.1 Chemical Stability

Stable under recommended storage/use conditions (≤25℃, dry, sealed); extremely stable in food system pH (2.0-7.0); no decomposition in high temperature food processing (≤121℃, sterilization/baking).

10.2 Possibility of Hazardous Reactions

No hazardous reactions under normal food production and use conditions; no polymerization; neutralization reaction with strong alkalis (produces non-toxic citrate salts); chelates with metal ions (Ca^{2+}, Mg^{2+}) to form stable complexes.

10.3 Conditions to Avoid

Extreme high temperature (>300℃), direct contact with strong alkalis/strong oxidizing agents, prolonged exposure to high humidity (caking risk).

10.4 Incompatible Materials

Concentrated strong alkalis, high-concentration oxidizing agents, concentrated ammonia water, alkaline food additives (sodium bicarbonate, sodium carbonate).

10.5 Hazardous Decomposition Products

No hazardous decomposition products under normal use; decomposes into non-toxic carbon dioxide and water only at >300℃.

SECTION 11: Toxicological Information

11.1 Information on Toxicological Effects

- **Acute Toxicity**: Oral (Rat, LD_{50}) = 3040 mg/kg (mild toxicity); Dermal (Rabbit, LD_{50}) > 5000 mg/kg; Inhalation (Rat, LC_{50}) > 10 mg/m³ (4-hour exposure)
- **Skin Corrosion/Irritation**: Mild irritation (Rabbit test, 4-hour exposure, 50% solution); reversible after rinsing.
- **Serious Eye Damage/Irritation**: Moderate eye irritation (Rabbit test, 100 mg); reversible within 24 -48 hours after rinsing.
- **Respiratory/Skin Sensitization**: No sensitizing effects reported in long-term human and animal use tests.
- **Germ Cell Mutagenicity**: No mutagenic effects (Ames test, chromosome aberration test).
- **Carcinogenicity**: IARC Class 3 (not classifiable as to its carcinogenicity to humans); recognized as a safe food additive by FDA/FAO/WHO, GRAS certified.
- **Reproductive Toxicity**: No adverse reproductive effects in animal tests; safe for pregnant and lactating women at standard food intake.
- **Specific Target Organ Toxicity**: No target organ toxicity at standard dosages; naturally present in human body (Krebs cycle intermediate), metabolized to CO_2 and water.
- **Aspiration Hazard**: Low (crystalline powder, moderate bulk density, no aspiration risk for humans/animals).

11.2 Additional Information

Citric Acid is a natural metabolic intermediate in human and animal bodies (Krebs cycle); widely present in citrus fruits; approved as a food additive by FAO/WHO/Codex Alimentarius; long-term food, beverage and pharmaceutical use data confirm its high safety at standard dosages, with no toxic side effects.

SECTION 12: Ecological Information

12.1 Toxicity

- Fish (Zebrafish, LC_{50}): > 5000 mg/L (96-hour exposure)
- Daphnia (EC_{50}): > 2000 mg/L (48-hour exposure)
- Algae (EC_{50}): > 5000 mg/L (72-hour exposure)No toxic effects on aquatic organisms; chelates with heavy metal ions in water to reduce bioavailability.

12.2 Persistence and Degradability

Fully biodegradable (BOD_5 /COD > 0.9) in aquatic/soil environments; degraded by microorganisms into small molecular nutrients and inorganic substances within 1-2 days; no residual pollution.

12.3 Bioaccumulative Potential

None; Citric Acid is a water-soluble small molecule, rapidly metabolized and utilized by all organisms; no bioaccumulation in aquatic/terrestrial organisms or food chain.

12.4 Mobility in Soil

High mobility (freely soluble in water); readily dissolves in soil water, but rapidly degraded by soil microorganisms; no long-term soil accumulation, no groundwater pollution risk.

12.5 PBT/vPvB Assessment

Not classified as PBT/vPvB (fully biodegradable, low toxicity, no bioaccumulation).

12.6 Endocrine Disrupting Properties

No endocrine disrupting effects reported in standard tests and long-term food use data.

12.7 Other Adverse Effects

No known adverse ecological impacts; environmentally benign, can reduce heavy metal pollution in water bodies through chelation.

SECTION 13: Disposal Considerations

13.1 Waste Treatment Methods

- **Product Waste**: Uncontaminated waste can be reused as food/feed additive or industrial raw material; contaminated waste can be neutralized with dilute alkali (5% NaOH) then disposed of as non-hazardous solid waste in accordance with local/national food safety regulations; aqueous waste can be directly treated by biological wastewater treatment systems after neutralization.
- **Packaging Waste**: Rinse empty containers thoroughly with pure water (rinse water can be used for food/feed preparation if qualified); dispose of rinsed packaging as food-grade non-hazardous waste or recycle (HDPE/paper/aluminum foil packaging).

13.2 Disposal Notes

Neutralize spilled powder with dilute alkali before disposal to reduce irritation; incineration is acceptable (produces only CO_2 and H_2O); landfilling is acceptable and the product will biodegrade in soil.

SECTION 14: Transport Information

14.1 UN Number

ADR/RID: -; IMDG: -; IATA-DGR: -

14.2 UN Proper Shipping Name

ADR/RID: Not dangerous goods; IMDG: Not dangerous goods; IATA-DGR: Not dangerous goods

14.3 Transport Hazard Class(es)

ADR/RID: -; IMDG: -; IATA-DGR: -

14.4 Packaging Group

ADR/RID: -; IMDG: -; IATA-DGR: -

14.5 Environmental Hazards

ADR/RID: No; IMDG Marine Pollutant: No; IATA-DGR: No

14.6 Special Precautions for User

Transport at ≤ 25℃; use sealed, moisture-proof packaging; avoid rain, moisture, direct sunlight and package collision during transport; prevent powder leakage and caking; use pallets for loading to avoid ground contact and contamination.

14.7 Incompatible Materials

Avoid transport with strong alkalis, strong oxidizing agents, alkaline food additives and non-food grade hazardous chemicals.**Further Information**: Classified as non-dangerous goods under international transport regulations; comply with food additive transport hygiene and safety standards, mark with **"Irritant"** and **"Food Grade"** on the package.

SECTION 15: Regulatory Information

15.1 National Regulations (China)

- Hazardous Chemical Safety Management Regulation (Non-hazardous classification)
- National Food Safety Standard for Food Additives (GB 2760-2021)
- Food Hygiene Law of the People's Republic of China
- National Food Safety Standard for Infant Formula Food (GB 10765/GB 10767)

15.2 International Regulations

- GHS Classification (Rev. 9): Skin Irrit. 2, Eye Irrit. 2
- REACH (EU): Registered; not listed in SVHC Candidate List; complies with EC 1333/2008 (food additives)
- TSCA (US): Listed on the TSCA Inventory; GRAS certified by FDA (21 CFR 184.1033)
- Codex Alimentarius (FAO/WHO): Approved as food acidulant, preservative and chelating agent (Codex STAN 192-1995)

15.3 Other Regulations

Comply with local food safety, environmental protection and transport regulations; follow the maximum addition limit of acidulants in food products specified by national and international standards; no special regulatory restrictions for Citric Acid in food industry.

SECTION 16: Other Information

16.1 Further Information

This MSDS is based on current scientific knowledge and complies with GB/T 16483, GB/T 17519, GHS, IMDG and IATA standards. It is intended for the safe handling, storage, transport and disposal of food-grade Citric Acid. The supplier is not liable for any damage caused by improper use, non-compliance with safety precautions or violation of national food additive use standards.

16.2 Revision History

First version (26 FEB 2026)