Safety Data Sheet (MSDS)

- Fumaric Acid (Food Grade)

(Compliant with GB/T 16483, GB/T 17519; Adapts to GHS Rev.9, IMDG, IATA Standards)**Revision Date: 28 FEB 2026**

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

1.1 Product Identifiers

- Product Name: Fumaric Acid (Food Grade)
- Product Number: FA-20260228
- Brand: SIGALD
- CAS-No.: 110-17-8
- EINECS/EC-No.: 203-743-0
- MDL Number: MFCD00002882
- Synonyms: trans-Butenedioic acid; Boletic acid; Food Grade Acidulant1.2 Details of the supplier of the safety data sheet
- 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: +86-021-503500291.3 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, gelling agent aid) for beverage, bakery, confectionery, dairy, canned food, jam and processed food industries; also used as a raw material for food flavor synthesis.
- Uses Advised Against: Avoid excessive inhalation of dust for asthmatic individuals; no undiluted oral consumption in large quantities.

SECTION 2: Hazards Identification

2.1 GHS ClassificationNot a hazardous substance or mixture (GHS 0 category); mild eye/respiratory irritation may occur from bulk dust inhalation (no formal GHS classification).2.2 GHS Label Elements

- Hazard Pictograms: None
- Signal Word: None
- Hazard Statements: None
- Precautionary Statements:
  - P261: Avoid breathing dust
  - P304+P340: If inhaled: Move person to fresh air and keep comfortable for breathing
  - P337+P313: If eye irritation persists: Get medical advice/attention
  - P280: Wear protective gloves if handling large quantities2.3 Physical and Chemical HazardsNo physical/chemical hazards; non-combustible, no explosion risk, no oxidative properties; low

hygroscopicity, stable under normal food processing and storage conditions; insoluble in most organic solvents.2.4 Health Hazards

- No acute/chronic systemic toxicity; mild transient eye/respiratory irritation in sensitive individuals from bulk dust contact; slight skin irritation with prolonged direct contact (no sensitization), no known allergenicity.
- Large oral ingestion may cause mild gastrointestinal discomfort (nausea, abdominal pain); no cumulative toxicity, genotoxicity or carcinogenicity at food-grade application levels.
- Metabolized to malic acid in the human body, a natural intermediate of the tricarboxylic acid cycle.2.5 Environmental Hazards
- Environmentally friendly; fully biodegradable (microbial degradation to CO_2 and H_2O); no toxic breakdown products.
- No acute aquatic toxicity (Zebrafish LC_{50},96h >10000 mg/L); no bioaccumulation potential; no soil/water pollution risk.2.6 Other HazardsLow water solubility may cause slight dust accumulation during handling; no other hazards for food-grade application.

SECTION 3: Composition/Information on Ingredients

- Substance / Mixture: Pure substance (food grade)
- Chemical Name: trans-Butenedioic acid
- Formula: $C_4H_4O_4$
- Molecular Weight: 116.07 Da
- CAS-No.: 110-17-8
- EINECS/EC-No.: 203-743-0

Component	Classification	Concentration (w/w)	CAS No.	Hazard Statements
Fumaric Acid (Food Grade)	Non-hazardous	≥99.5%	110-17-8	None
Maleic Acid (trace)	Non-hazardous	≤0.1%	110-16-7	None
Water	Non-hazardous	≤0.5%	7732-18-5	None

SECTION 4: First Aid Measures

4.1 Description of First-Aid Measures

- **Inhalation**: Move victim to fresh air, keep airway open. Rinse mouth with water; no special treatment if no discomfort. Consult a doctor if coughing/irritation persists for more than 2 hours.
- **Skin Contact**: Brush off residual powder, rinse affected area with running water for 3-5 minutes. Dry skin thoroughly; apply mild moisturizer if slight irritation occurs. No further treatment needed for normal contact.
- **Eye Contact**: Rinse eyes cautiously with plenty of running water for 5-10 minutes (hold eyelids open). Remove contact lenses if present and easy to do. Consult a doctor only if mild irritation persists.
- **Ingestion**: Rinse mouth with water, drink plenty of water or milk (do not induce vomiting). No special treatment if no discomfort; consult a doctor if abdominal pain/nausea occurs (only for large ingestion).4.2 Most Important Symptoms and Effects

- Acute: Mild transient eye/respiratory irritation from bulk dust; slight skin irritation with prolonged contact; mild gastrointestinal discomfort from large oral ingestion.
- Delayed: No known delayed toxic effects based on comprehensive toxicological testing.4.3 Indication of Immediate Medical AttentionNo immediate medical attention required for normal food-grade handling/accidental contact; consult a doctor only if irritation symptoms persist or large amounts are ingested with severe discomfort.

SECTION 5: Firefighting Measures

5.1 Extinguishing Media

- **Suitable**: All common fire-extinguishing media (water spray, CO_2, dry chemical powder, foam).
- **Unsuitable**: None (no fire hazards associated with the product).5.2 Special Hazards Arising from the Substance or Mixture
- Non-combustible; no flammable vapors/gases produced during combustion.
- Decomposes at high temperature (>400℃) to produce non-toxic carbon dioxide and water; no hazardous combustion products.5.3 Advice for Firefighters
- Wear standard fire-fighting gear (no special protective equipment required); fight fire from upwind.
- Cool exposed containers with water spray if near fire (prevent thermal expansion); no special firefighting precautions needed.

SECTION 6: Accidental Release Measures

6.1 Personal Precautions

- Wear N95 dust mask and disposable food-grade nitrile gloves for large spills (to avoid dust inhalation/skin contact); ensure good ventilation in the spill area.
- No open flames/sparks required (no fire risk); no special PPE for small spills.6.2 Environmental Precautions
- No special environmental precautions; the product is non-toxic and biodegradable. Prevent large spills from entering drains/sewers only to avoid slight clogging (no pollution risk).6.3 Methods and Materials for Containment and Cleaning Up
- **Small Spill**: Sweep into a sealed HDPE container for reuse; wipe the area with a dry cloth (dispose as general waste).
- **Large Spill**: Collect with a dust-free vacuum cleaner into sealed food-grade drums for reuse; no need for neutralization (non-corrosive).
- **Note**: Avoid wetting the powder during cleanup (low water solubility may cause slurry formation).6.4 Reference to Other SectionsSee Section 13 for waste disposal; Section 8 for PPE details.

SECTION 7: Handling and Storage

7.1 Precautions for Safe Handling

- Operate in a well-ventilated area to prevent dust accumulation (may cause mild irritation).

- Use dry food-grade equipment/tools (HDPE, stainless steel) for weighing/mixing; avoid generating excessive dust.
- Hygiene Measures: Wash hands/face thoroughly with soap and water after handling; do not eat/drink/smoke in the processing area.7.2 Conditions for Safe Storage
- **Storage Type**: Store in a cool, dry, well-ventilated food-grade warehouse; temperature ≤25℃, relative humidity ≤60% (prevents slight hygroscopic caking).
- **Containers**: Sealed food-grade HDPE plastic drums/aluminum foil bags; label clearly with product name and batch number.
- **Incompatibilities**: No significant incompatibilities; avoid long-term contact with strong bases (reacts to form fumarate salts, non-hazardous) and excessive moisture.
- **Separation**: Store separately from strong alkaline food additives; no special separation distance required for other food raw materials/additives.
- **Shelf Life**: 36 months (unopened, in specified storage conditions); 6 months after opening (if resealed tightly).7.3 Specific End UseOnly for food production as acidulant, flavor enhancer and preservative; compliant with GB 2760/FDA/EC dosage limits.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control Parameters

- No official occupational exposure limits (OEL) for food-grade fumaric acid; follow general industrial dust limit (10 mg/m³ TWA) for bulk handling (national occupational health standards).
- No PEL/REL established by US OSHA/NIOSH (non-hazardous substance).8.2 Exposure Controls
- **Engineering Controls**: Local exhaust ventilation (air exchange rate ≥6 times/hour) for bulk handling/loading/unloading; closed mixing systems to minimize dust release.
- **Personal Protective Equipment (PPE)**:
  - **Respiratory Protection**: N95 dust mask (**only** for bulk dust handling; no respirator required for normal use).
  - **Eye/Face Protection**: Food-grade safety glasses (recommended for large-scale dust handling; no face shield required).
  - **Skin Protection**: Disposable food-grade nitrile gloves (optional for normal handling; mandatory for large-quantity processing).
  - **Other**: Dust-proof food-grade overalls and non-slip shoes (for industrial processing).8.3 Environmental Exposure Controls
- No special environmental exposure controls; use closed transfer systems to prevent dust release; no wastewater/air pollution associated with handling.

SECTION 9: Physical and Chemical Properties

Property	Details (25℃, 1 atm)
Physical State	White crystalline powder
Color	Pure white
Odor	Odorless
Taste	Sour, clean, no off-taste
Melting Point	287℃ (decomposition)
Boiling Point	N/A (decomposes before boiling)
Flammability	Non-combustible
Flash Point	Not applicable
Autoignition Temperature	>400℃
Vapor Pressure	<0.0001 kPa (25℃)
Vapor Density	N/A (solid, no vapor)
Relative Density (Water=1)	1.635
pH Value (1% aqueous suspension)	2.0-2.5
Water Solubility	Low (0.63 g/100mL at 25℃; increases with temperature)
Solubility	Insoluble in ethanol/ether/benzene; soluble in hot water/alkaline solutions
Hygroscopy	Low (slightly hygroscopic under high humidity)
Viscosity	N/A (solid; hot aqueous solution: 2-3 mPa·s)
Refractive Index	1.526 (crystal)
Corrosivity	Non-corrosive to metal/plastic/glass (food-grade materials)

SECTION 10: Stability and Reactivity

10.1 Chemical Stability: **Highly stable** under recommended storage/handling conditions (dry, sealed, ≤25℃); no decomposition, no isomerization to maleic acid under normal food processing conditions (0-121℃).10.2 Possibility of Hazardous Reactions:

- Reacts with strong bases (NaOH, KOH) to form water-soluble fumarate salts (no gas/heat release, non-hazardous).
- No hazardous reactions with water, food ingredients or other food additives (except strong bases).10.3 Conditions to Avoid: Excessive moisture/high humidity (slight caking), high temperature (>400℃, decomposition), long-term contact with strong bases.10.4 Incompatible Materials: Concentrated strong alkaline solutions (sodium hydroxide, potassium hydroxide); no other significant incompatibilities.10.5 Hazardous Decomposition Products: Non-toxic carbon dioxide (CO_2) and water (H_2O) at >400℃; no toxic decomposition products.10.6 Hazardous Polymerization: Will not occur under any conditions (food-grade fumaric acid).

SECTION 11: Toxicological Information

11.1 Information on Toxicological Effects

- **Acute Toxicity**: Oral (Rat, LD_{50}) >5000 mg/kg; Dermal (Rabbit, LD_{50}) >10000 mg/kg; Inhalation (Rat, LC_{50}) >2000 mg/m³/4h – **Practically non-toxic**.
- **Skin Corrosion/Irritation**: Slight skin irritation with prolonged contact (GHS 0 category); no corrosion, no sensitization.

- **Serious Eye Damage/Irritation**: Mild transient eye irritation from bulk dust (GHS 0 category); no irreversible eye damage.
- **Respiratory Irritation**: Mild transient respiratory irritation from bulk dust (GHS 0 category).
- **Germ Cell Mutagenicity**: Negative (Ames test, chromosome aberration test; no genotoxicity).
- **Carcinogenicity**: IARC Group 3 (not classifiable as to carcinogenicity to humans; no evidence of carcinogenicity).
- **Reproductive Toxicity**: No reproductive/developmental toxicity (rat feeding test at 5000 mg/kg/day; safe for maternal/fetal health).
- **Specific Target Organ Toxicity**: No single/chronic target organ toxicity (metabolized to natural malic acid in the body; excess is excreted).11.2 Additional InformationFumaric acid is a natural component of fruits (apple, peach) and mushrooms; metabolized to malic acid in the human body, no accumulation; suitable for all population groups including infants, the elderly and pregnant women at food-grade application levels.

SECTION 12: Ecological Information

12.1 Toxicity:

- Aquatic: Zebrafish (LC_{50},96h) >10000 mg/L (non-toxic); Daphnia (EC_{50},48h) >10000 mg/L (non-toxic); Algae (EC_{50},72h) >5000 mg/L (non-toxic).
- Terrestrial: No toxic effect on soil microorganisms/plants; decomposed into CO_2 and water, no residual harm.12.2 Persistence and Degradability: Fully biodegradable (BOD_5 /COD >0.9); degraded by aerobic/anaerobic microorganisms into CO_2 and H_2O within 5-7 days (no environmental persistence).12.3 Bioaccumulative Potential: Log Kow = -0.72 (no bioaccumulation potential; low water solubility, rapidly metabolized by organisms).12.4 Mobility in Soil: Low mobility; slightly soluble in water, adsorbs to soil particles, no leaching risk to groundwater.12.5 PBT/vPvB Assessment: Not classified as PBT/vPvB (biodegradable, non-toxic, no bioaccumulation, low persistence).12.6 Other Adverse Effects: No known long-term ecological effects; no soil/water pollution risk; decomposed products are natural components of the environment.

SECTION 13: Disposal Considerations

13.1 Waste Treatment Methods

- **Uncontaminated Product Waste**: Reuse directly (even if slightly caked, grind and use); expired waste can be disposed of as general solid waste (non-hazardous) or mixed with organic fertilizer (decomposes to natural components).
- **Contaminated Waste**: Collect in sealed HDPE containers, dispose of through licensed general waste treatment facilities (no hazardous waste treatment required).
- **Packaging Waste**: Rinse containers thoroughly with water (meet food hygiene standards); recycle/dispose of as non-hazardous plastic/foil waste (no residual hazards).13.2 Disposal Compliance: Comply with China General Solid Waste Pollution Control Law, Food Safety Law and local environmental regulations; no hazardous waste disposal procedures required.

SECTION 14: Transport Information

14.1 UN Number: None (non-hazardous substance)14.2 UN Proper Shipping Name: None (not a hazardous good)14.3 Transport Hazard Class(es): None14.4 Packaging Group: None14.5 Environmental Hazards: IMDG Marine Pollutant: **No**; ADR/RID: No14.6 Special Precautions for User

- Transport in sealed food-grade HDPE drums/aluminum foil bags to prevent slight hygroscopic caking and dust release.
- Use covered dry transport vehicles; avoid rain, snow, moisture and direct sunlight during transport (maintain relative humidity ≤60%).
- Secure containers to prevent tipping/collision; no mixing with strong alkaline food additives/chemicals in the same vehicle.
- No special transport documentation required (non-hazardous food additive); comply with general food raw material transport regulations.14.7 Further Information: Complies with ADR/RID, IMDG, IATA-DGR regulations for non-hazardous goods; no special transport restrictions.

SECTION 15: Regulatory Information

15.1 National/International Regulations

- **China**: Compliant with GB 2760 (National Food Safety Standard for Food Additives), GB 1886.58 -2015 (Food Additive Fumaric Acid); classified as non-hazardous chemical (Hazardous Chemical Safety Management Regulation); approved for use in most food categories with specified dosage limits.
- **EU**: Compliant with EC 1333/2008 (Food Additive Regulation); E297 (food additive code); REACH registered (no SVHC); approved for food use with GMP dosage limits.
- **US**: TSCA listed (CAS 110-17-8); FDA GRAS (21 CFR Part 184.1069); approved for food use as acidulant/flavor enhancer/preservative with specified dosage limits.
- **International**: Complies with Codex Alimentarius Commission (CAC) standards; FCC/USP certified (food grade); recognized as a safe food additive worldwide.15.2 Other Regulations: Comply with local food safety, occupational health and environmental regulations; food production use must meet GMP/HACCP standards.

SECTION 16: Other Information

- **Further Information**: This MSDS is for **Food Grade Fumaric Acid (≥99.5%)** (CAS 110-17-8), compliant with GB/T 16483, GB/T 17519 and GHS Rev.9. It applies to safe handling, storage, transport and disposal of the product for food production use. The supplier is not liable for damage caused by improper use (e.g., exposure to excessive moisture, long-term contact with strong bases) or non-compliance with storage precautions.
- **Revision Date**: 28 FEB 2026
- **Version**: V1.0