Safety Data Sheet (MSDS)

(According to GB/T 16483 and GB/T 17519; Adapts to GHS, IMDG, IATA Standards)

Lactic Acid (Food Grade, 80% Liquid)

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

1.1 Product Identifiers

- Product Name: Lactic Acid (Food Grade, 80% Liquid)
- Product Number: LA-20260225
- Brand: SIGALD
- CAS-No.: 50-21-5
- Synonyms: 2-Hydroxypropanoic acid; Lactic acid (80% aqueous); 乳酸（食品级）
- EC-No.: 200-018-0

1.2 Details of the supplier of the safety data sheet

- Company: NEWAY SINOPHC TECH. LIMITED
- 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 of the Substance or Mixture and Uses Advised Against

- Identified Uses: Food additive (acidity regulator, preservative, flavor enhancer, humectant) for beverage, dairy, pastry, meat, pickled food; cosmetic humectant; pharmaceutical excipient; industrial acidulant (non-food grade).
- Uses Advised Against: Not for undiluted direct skin/eye contact in large amounts; avoid mixing with strong oxidants in closed containers.

SECTION 2: Hazards Identification

|Summary of Emergency Measures|Colorless clear viscous liquid. Slightly hazardous (corrosive/irritant). After inhalation: Move to fresh air, keep respiratory tract unobstructed. In case of skin contact: Rinse skin with plenty of running water for 10-15 minutes. After eye contact: Rinse with plenty of water for at least 15 minutes, consult a doctor immediately. After swallowing: Rinse mouth with water, drink plenty of milk/water to dilute, do not induce vomiting, consult a doctor. Non-combustible. No explosion risk.| |---|

2.1 GHS Classification

- Skin corrosion/irritation (Category 1B)
- Serious eye damage/eye irritation (Category 1)
- Specific target organ toxicity - single exposure (Respiratory tract, Category 3)

2.2 GHS Label Elements

- Hazard Pictogram: (Corrosion)
- Signal Word: **Danger**

- Hazard Statements:
  - H314: Causes severe skin burns and eye damage
  - H335: May cause respiratory irritation
- Precautionary Statements:
  - P260: Do not breathe mist/vapours/spray
  - P264: Wash skin thoroughly after handling
  - P280: Wear protective gloves/eye protection/face protection
  - P301+P330+P331: If swallowed: Rinse mouth. Do NOT induce vomiting.
  - P303+P361+P353: If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  - P304+P340: If inhaled: Remove person to fresh air and keep comfortable for breathing.
  - P305+P351+P338: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  - P310: Immediately call a POISON CENTER/doctor.
  - P363: Wash contaminated clothing before reuse.

2.3 Physical and Chemical Hazards

Non-combustible, no explosion risk; decomposes at ≥200℃ to release non-toxic carbon dioxide and water; reacts with strong bases to produce lactate salts (exothermic); reacts with strong oxidants to cause mild exotherm.

2.4 Health Hazards

- Inhalation of mist/vapour may cause respiratory tract irritation (cough, sore throat, chest tightness) in sensitive individuals.
- Undiluted direct skin contact causes severe burns, redness, blistering and corrosion.
- Direct eye contact causes severe burns, corneal damage and permanent eye injury if not treated in time.
- Accidental swallowing of undiluted liquid causes oral, esophageal and gastric mucosal burns, nausea, vomiting and abdominal pain; food-grade diluted use has no acute toxicity.

2.5 Environmental Hazards

Environmentally friendly; fully biodegradable in water/soil; no adverse effects on aquatic/terrestrial organisms at normal food use concentration; no bioaccumulation potential; low concentration has no alkalization/acidification impact on water body.

2.6 Other Hazards

No additional hazards identified.

SECTION 3: Composition/Information on Ingredients

- Substance / Mixture: Pure substance (80% aqueous solution)

3.1 Main Components

Formula	$C_3H_6O_3$ (2-Hydroxypropanoic acid)
Molecular Weight	90.08 g/mol
CAS-No.:	50-21-5
EC-No.:	200-018-0
Concentration (w/w)	80.0% (Food Grade)
Other Component	Deionized Water (20.0%)

Hazardous Ingredients

Component	Classification	Concentration (w/w)
Lactic Acid (80% aq.)	Skin Corrosive 1B, Eye Damage 1, Respiratory Irritant 3	80.0%
Total Hazardous Ingredients	**100%**	**80.0%**

SECTION 4: First Aid Measures

4.1 Description of First-Aid Measures

- If Inhaled: Move victim to fresh air and rest in a comfortable breathing position. Loosen tight clothing. If breathing is difficult, give oxygen and call a doctor immediately.
- In Case of Skin Contact: Immediately rinse skin with plenty of running water for 10-15 minutes (remove contaminated clothing/shoes while rinsing). Do not use neutralizer without medical advice. If burns occur, cover with sterile gauze and seek medical treatment immediately.
- In Case of Eye Contact: Hold eyes open and rinse thoroughly with plenty of running water for at least 15 minutes (rinse from inner to outer corner). Do not rub eyes. Remove contact lenses if present (only after initial rinsing). Call an ophthalmologist immediately, even if no symptoms appear.
- If Swallowed: Rinse mouth with clean water (do not swallow). Drink 200-300 mL milk or water to dilute (do not use alkaline solution to neutralize). Do not induce vomiting (risk of esophageal re -burn). Call a doctor or poison control center immediately.

4.2 Most Important Symptoms and Effects, Both Acute and Delayed

- Acute Effects: Respiratory irritation, severe skin/eye burns, mucosal damage from ingestion, abdominal pain, nausea.
- Delayed Effects: Skin scarring from severe burns, permanent eye damage (if untreated); no delayed systemic toxicity.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

No specific antidote; treat symptomatically (e.g., burn dressing for skin/eye, supportive treatment for ingestion). Neutralization only under medical supervision.

4.4 Notes to Physician

Inform the physician of the product concentration and exposure route; avoid oral neutralizers for ingestion (risk of gas expansion).

SECTION 5: Firefighting Measures

5.1 Extinguishing Media

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

5.2 Special Hazards Arising from the Substance or Mixture

- Non-combustible; no flame or smoke during combustion (if involved in fire); decomposes at ≥200℃ to release non-toxic carbon dioxide and water vapor.
- No hazardous combustion products; mist may cause mild respiratory irritation to firefighters.

5.3 Advice for Firefighters

- Wear self-contained breathing apparatus (SCBA) and full chemical protective gear (acid-resistant) to avoid inhalation of mist and skin/eye contact.
- Cool containers with water spray to prevent overheating and splashing; keep a safe distance from leaking containers.
- Ensure good ventilation at fire scene to disperse mist.

SECTION 6: Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

- Wear acid-resistant nitrile rubber gloves, chemical protective goggles, face shield, acid-resistant protective clothing and FFP2 respirator (for mist).
- Evacuate non-essential personnel from the spill area; ensure good ventilation to disperse mist.
- Do not touch or walk through the spilled liquid directly; avoid breathing mist.

6.2 Environmental Precautions

- Prevent spilled liquid from entering sewers, rivers, lakes or other water bodies; build dikes to contain large spills.
- Dilute small spills in water with neutralizer (sodium bicarbonate) to adjust pH to 6-8 before discharge; no special treatment for food-grade dilute spills.

6.3 Methods and Materials for Containment and Cleaning Up

- Small Spill: Absorb with inert absorbent materials (vermiculite, sand, diatomite) – do not use sawdust (acid reaction). Transfer absorbent to sealed HDPE drums for disposal; rinse the area with plenty of water.
- Large Spill: Contain with plastic dikes; transfer the liquid to sealed HDPE drums with a pump (no direct contact); neutralize the residual liquid with sodium bicarbonate and rinse with water.

6.4 Reference to Other Sections

For disposal, see Section 13.

SECTION 7: Handling and Storage

7.1 Precautions for Safe Handling

- Operate in a well-ventilated area with local exhaust ventilation (to capture mist); use closed transfer equipment for large-scale handling to avoid splashing and mist generation.

- Wear full personal protective equipment (PPE) as specified in Section 8; wash hands/face thoroughly with soap and water after handling; do not eat, drink or smoke in the workplace.
- Avoid contact with strong bases, strong oxidants and metals (e.g., iron, aluminum) for long time (slow reaction); dilute with water in a **stirred vessel (add acid to water, not water to acid)** to prevent splashing.
- Use acid-resistant tools and equipment (HDPE, glass, stainless steel 316L); no friction/impact (no explosion risk).

7.2 Conditions for Safe Storage, Including Any Incompatibilities

- **Storage Conditions**: Store in a cool, dry, well-ventilated food-grade warehouse. Keep container tightly sealed to prevent evaporation and contamination. Storage temperature **≤30℃**, avoid direct sunlight and high temperature.
- **Incompatibilities**: Strong bases (NaOH, KOH), strong oxidants (hydrogen peroxide, potassium permanganate), active metals (Al, Zn, Fe), alkaline food additives (sodium bicarbonate, ammonium bicarbonate).
- **Storage Class (TRGS 510)**: 8 (Corrosive Substances, acidic)
- **Shelf Life**: 24 months (unopened, under specified storage conditions); 6 months after opening (re-seal tightly and use as soon as possible).
- **Packaging Requirements**: Store in acid-resistant sealed HDPE drums or glass bottles (food grade); avoid metal packaging.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control Parameters

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Component	CAS-No.	TLV-TWA (8h)	TLV-STEL (15min)	Basis
Lactic Acid	50-21-5	5 ppm (18 mg/m³)	10 ppm (36 mg/m³)	ACGIH

8.2 Exposure Controls

- **Engineering Controls**: Install local exhaust ventilation at the operation station (capture efficiency ≥90%); use closed-loop transfer systems for bulk handling; maintain general ventilation in the workplace.
- **Personal Protective Equipment (PPE)**:
  - Eye/Face Protection: Acid-resistant chemical protective goggles + face shield (mandatory for all handling).
  - Skin Protection: Acid-resistant nitrile rubber gloves (thickness ≥0.18mm), acid-resistant protective clothing, anti-slip acid-resistant safety shoes.
  - Respiratory Protection: FFP2 respirator for mist generation; SCBA for high-concentration mist/spill.
  - Hand Protection: Replace gloves if damaged/contaminated; wash gloves before removal.
- **Control of Environmental Exposure**: Do not discharge undiluted liquid into the environment; treat waste liquid with neutralizer before discharge.

SECTION 9: Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

a) Physical State: Liquid (viscous)b) Color: Colorless to pale yellowc) Odor: Mild sour odor (characteristic of lactic acid)d) Melting Point/Freezing Point: 18℃ (pure lactic acid); -20℃ (80% aqueous solution)e) Initial Boiling Point and Boiling Range: 122℃ (1.33 kPa, pure); 100-105℃ (80% aq., water evaporation)f) Flammability (Liquid/Gas): Non-combustibleg) Upper/Lower Flammability or Explosive Limits: Not applicableh) Flash Point: > 100℃ (Closed Cup, 80% aq.)i) Autoignition Temperature: > 400℃ (pure)j) Decomposition Temperature: ≥200℃ (decomposes to CO_2 and H_2O)k) pH Value (25℃): 1.0-2.0 (10% aqueous solution); 0.5 (80% undiluted)l) Viscosity (25℃): 200-300 mPa·s (80% aq.)m) Water Solubility: Miscible with water in all proportionsn) Partition Coefficient (n-octanol/water): -0.79 (25℃)o) Vapor Pressure (25℃): 0.01 hPa (80% aq.)p) Density (25℃): 1.20-1.22 g/cm³ (80% aq.)q) Bulk Density: Not applicable (liquid)r) Particle Characteristics: Not applicable (liquid)s) Explosive Properties: Not explosivet) Oxidizing Properties: None (weak reducing property)

9.2 Other Safety Information

Hygroscopic (pure lactic acid); 80% aqueous solution is stable at room temperature; easy to form lactate salts with metal ions; compatible with most polar solvents.

SECTION 10: Stability and Reactivity

10.1 Chemical Stability

Stable under recommended storage and food use conditions (≤30℃, sealed); no spontaneous reaction with air/water at room temperature; stable in food processing (pasteurization, boiling).

10.2 Possibility of Hazardous Reactions

- Reacts **violently (exothermic)** with strong bases to produce lactate salts, may cause splashing if mixed in large amounts.
- Reacts slowly with active metals (Al, Zn) to release hydrogen gas (risk of accumulation in closed containers).
- Decomposes at ≥200℃ to release non-toxic CO_2 and H_2O; no polymerization reaction under any conditions.

10.3 Conditions to Avoid

High temperature (≥200℃), direct sunlight, undiluted contact with skin/eyes, mixing with strong bases/oxidants/active metals, adding water to concentrated acid (reverse dilution).

10.4 Incompatible Materials

- Strong bases: Sodium hydroxide, potassium hydroxide, calcium hydroxide.
- Strong oxidants: Hydrogen peroxide, potassium permanganate, sodium hypochlorite.
- Active metals: Aluminum, zinc, iron (powder).
- Alkaline food additives: Sodium bicarbonate, ammonium bicarbonate, potassium sorbate (high concentration).

10.5 Hazardous Decomposition Products

Carbon dioxide (CO_2), water (H_2O); **no toxic decomposition products** at any temperature.

SECTION 11: Toxicological Information

11.1 Information on Toxicological Effects

- **Acute Toxicity**:
  - Oral (Rat, LD_{50}): 3730 mg/kg (80% aq.)
  - Dermal (Rabbit, LD_{50}): >2000 mg/kg (80% aq., corrosive not toxic)
  - Inhalation (Rat, LC_{50}): >5000 mg/m³ (4-hour exposure, mist)
- **Skin Corrosion/Irritation**: Severe corrosion (Rabbit test, 4-hour exposure; 80% aq.) – redness, blistering, tissue necrosis.
- **Serious Eye Damage/Eye Irritation**: Severe eye damage (Rabbit test, 80% aq.) – corneal erosion, permanent injury.
- **Respiratory or Skin Sensitization**: No skin/respiratory sensitization (long-term human/animal use data).
- **Germ Cell Mutagenicity**: No mutagenic effects (Ames test, chromosome aberration test); negative results.
- **Carcinogenicity**: Not classified as carcinogenic by IARC, EPA, or NTP; FDA/CFDA GRAS certified (food grade).
- **Reproductive Toxicity**: No adverse reproductive/developmental effects in animal tests (rat/mouse) at food dosage; high concentration has no teratogenic effect.
- **Specific Target Organ Toxicity (Single/Repeated Exposure)**: No target organ toxicity at food dilute dosage; repeated inhalation of mist may cause chronic respiratory irritation.
- **Aspiration Hazard**: Low (80% aq., high viscosity; no aspiration risk for normal handling).

11.2 Additional Information

Approved by FAO/WHO Codex Alimentarius, **ADI: Not specified (no limitation)**; lactic acid is a natural metabolite in human body (muscle tissue), safe for long-term human consumption in compliance with GB 2760-2021 dosage standards.

SECTION 12: Ecological Information

12.1 Toxicity

- Fish (Zebrafish, LC_{50}): >1000 mg/L (96-hour exposure, 10% aq.)
- Daphnia (EC_{50}): >800 mg/L (48-hour exposure, 10% aq.)
- Algae (EC_{50}): >1500 mg/L (72-hour exposure, 10% aq.)No toxic effects on aquatic organisms at normal food use concentration; high concentration may cause slight water acidification (recoverable).

12.2 Persistence and Degradability

Fully biodegradable in water/soil (BOD_5/COD > 0.9); degraded by microorganisms (bacteria/fungi) into CO_2 and H_2O within 3-5 days; no persistent organic pollutants (POPs).

12.3 Bioaccumulative Potential

No bioaccumulation potential; lactic acid is a natural organic acid, rapidly metabolized by organisms, no accumulation in tissues/organs.

12.4 Mobility in Soil

High mobility in soil (miscible with water); easy to leach into groundwater, but rapidly biodegradable and no toxic effect on groundwater quality.

12.5 Results of PBT and vPvB Assessment

Not classified as PBT/vPvB (no persistence, no bioaccumulation, low toxicity at normal use); environmentally friendly food additive.

12.6 Other Adverse Effects

No known adverse effects on soil microorganisms, plants or terrestrial animals; can be used as a carbon source for microbial growth in the environment.

SECTION 13: Disposal Considerations

13.1 Waste Treatment Methods

- **Product Waste**: Uncontaminated dilute waste can be discharged to municipal sewage treatment plants (biodegradable); undiluted waste is neutralized with sodium bicarbonate (adjust pH to 6-8) then discharged; or disposed of by licensed hazardous waste treatment facilities.
- **Packaging Waste**: Rinse packaging thoroughly with water (neutralize with sodium bicarbonate if needed), then dispose of as non-hazardous waste or recycle (HDPE/glass).
- **Aqueous Waste**: Waste water containing lactic acid is neutralized then discharged to biological wastewater treatment systems, no special treatment required.

13.2 Disposal Notes

- Do not mix with alkaline waste in large amounts (exothermic reaction, splashing risk).
- Do not discharge undiluted liquid into water bodies/soil; comply with local, national and international waste disposal regulations (e.g., China GB 8978, EU WFD, US EPA).
- No open burning of waste (unnecessary, non-toxic decomposition).

SECTION 14: Transport Information

14.1 UN Number

ADR/RID: 3265; IMDG: 3265; IATA-DGR: 3265

14.2 UN Proper Shipping Name

ADR/RID: Corrosive liquid, acidic, organic, n.o.s. (Lactic acid, 80%); IMDG: Corrosive liquid, acidic, organic, n.o.s. (Lactic acid, 80%); IATA-DGR: Corrosive liquid, acidic, organic, n.o.s. (Lactic acid, 80%)

14.3 Transport Hazard Class(es)

ADR/RID: 8 (Corrosive substances); IMDG: 8 (Corrosive substances); IATA-DGR: 8 (Corrosive substances)

14.4 Packaging Group

ADR/RID: II (Moderate danger); IMDG: II (Moderate danger); IATA-DGR: II (Moderate danger)

14.5 Environmental Hazards

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

14.6 Special Precautions for User

- Transport at **≤30℃**; use acid-resistant sealed HDPE drums/glass bottles (food grade); avoid direct sunlight, high temperature and rain during transport.
- Do not stack heavy objects on the packaging to prevent leakage; use acid-resistant pallets for stacking.
- Do not transport with strong bases, strong oxidants, active metals and alkaline food additives (separate loading, independent compartment); no mixing with other corrosive substances.
- Ensure good ventilation in the transport vehicle; no smoking/open fire in the vehicle; carry emergency equipment (neutralizer: sodium bicarbonate, PPE, water).

14.7 Incompatible Materials

Avoid transport with strong bases, strong oxidants, active metals, alkaline food additives and corrosive alkalis.

Further Information: Classified as Class 8 corrosive substances under international transport regulations (ADR/RID, IMDG Code, IATA-DGR); transport by professional hazardous goods vehicles.

SECTION 15: Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

- **National Regulations (China)**:
  - Hazardous Chemical Safety Management Regulation (Class 8 corrosive substances)
  - National Food Safety Standard for Food Additives (GB 2760-2021) – approved as acidity regulator/preservative/humectant (no dosage limit for most food categories)
  - National Food Safety Standard for Lactic Acid (GB 1886.173-2016) – strict quality requirements for food grade
  - Water Pollution Prevention and Control Law, Air Pollution Prevention and Control Law
- **International Regulations**:
  - GHS Classification (Rev. 9): Skin Corr. 1B, Eye Dam. 1, STOT-single 3 (Resp. tract)
  - REACH (EU): Registered; not in SVHC Candidate List; complies with EC 1333/2008 (food grade)
  - TSCA (US): Listed on the TSCA Inventory; FDA GRAS certified (21 CFR 184.1061)
  - Codex Alimentarius (FAO/WHO): Approved as food additive (ADI: not specified)
  - FCC (Food Chemicals Codex): Grade V compliance

15.2 Other Regulations

Comply with local food safety, occupational health and environmental protection regulations; the workplace must meet the occupational exposure limit (OEL) of lactic acid mist; food use must follow GB 2760-2021 application scope.

SECTION 16: Other Information

- **Further Information**: This MSDS is based on current scientific knowledge and complies with GB/T 16483, GB/T 17519, and GHS standards. It is intended for safe handling, storage, transport, and disposal of food-grade Lactic Acid (80% liquid). The supplier is not liable for damage caused by improper use, storage or non-compliance with safety precautions.
- **Revision Date**: 25 FEB 2026
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