Safety Data Sheet (MSDS)

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

L-Cysteine HCl (Anhydrous 52-89-1 / Monohydrate 7048-04-6)

Revision Date: 26 FEB 2026

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

1.1 Product Identifiers

- Product Name: L-Cysteine HCl (Anhydrous / Monohydrate)
- Product Number: LCH-20260226 (Anhydrous); LCH-M-20260226 (Monohydrate)
- Brand: SIGALD
- CAS-No.: 52-89-1 (Anhydrous); 7048-04-6 (Monohydrate)
- Synonyms: L-2-Amino-3-mercaptopropionic acid hydrochloride; L-Cysteine hydrochloride anhydrous/monohydrate
- EINECS/EC-No.: 200-157-7 (Anhydrous); 230-327-2 (Monohydrate)

1.2 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: +86-021-50350029

1.3 Emergency telephone

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

1.4 Relevant Identified Uses and Uses Advised Against

- Identified Uses: Food additive (nutritional fortifier/antioxidant); pharmaceutical intermediate (drug synthesis); cosmetic raw material (moisturizer/antioxidant); feed additive (animal nutrition); organic synthesis raw material.
- Uses Advised Against: No direct use in high-temperature processing (>200℃) without protection; avoid mixing with strong oxidizing agents in unventilated areas.

SECTION 2: Hazards Identification

|Summary of Emergency Measures|White crystalline powder with slight sulfurous odor. Causes mild skin irritation and serious eye irritation; may cause mild respiratory irritation if inhaled as dust; mild gastrointestinal discomfort if swallowed. After inhalation: Move to fresh air, cough up dust if needed. In case of skin contact: Rinse with plenty of water for 10 minutes. After eye contact: Rinse with plenty of water for 15 minutes, call a doctor if irritation persists. After swallowing: Rinse mouth with water, drink a small amount of water, seek medical advice if discomfort occurs. Non-flammable, no explosion risk under normal conditions.| |---|

2.1 GHS Classification

- Skin irritation (Category 2)
- Serious eye irritation (Category 2)
- Specific target organ toxicity - single exposure (respiratory tract) (Category 3)

2.2 GHS Label Elements

- Hazard Pictogram: (Exclamation mark)
- Signal Word: **Warning**
- Hazard Statements:
  - H315: Causes skin irritation
  - H319: Causes serious eye irritation
  - H335: May cause respiratory irritation
- Precautionary Statements:
  - P261: Avoid breathing dust/fumes/gas/mist/vapors/spray
  - P264: Wash skin thoroughly after handling
  - P270: Do not eat, drink or smoke when using this product

- P280: Wear protective gloves/eye protection/face protection
- P302+P352: If on skin: Wash with plenty of water and soap
- P305+P351+P338: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing
- P304+P340: If inhaled: Remove person to fresh air and keep comfortable for breathing
- P312: Call a POISON CENTER or doctor/physician if you feel unwell
- P362+P364: Take off contaminated clothing and wash it before reuse
- P501: Dispose of contents/container to an approved waste disposal plant

2.3 Physical and Chemical HazardsNon-flammable solid; no explosive or oxidizing properties under normal conditions; decomposes at high temperature (>200℃) to produce slight sulfurous gas; reacts with strong oxidizing agents to produce mild toxic sulfur oxides; stable under recommended storage conditions (sealed, dry, cool). Slightly hygroscopic (monohydrate more stable against moisture).

2.4 Health Hazards

- Acute: Dust inhalation causes mild cough and throat irritation; skin contact causes slight redness and itching; eye contact causes severe redness, tearing and blurred vision; swallowing causes mild nausea and abdominal discomfort.
- Chronic: Prolonged repeated skin contact may cause mild chronic dermatitis; long-term inhalation of dust may cause mild persistent respiratory tract irritation; no known carcinogenic, mutagenic or reproductive toxic effects in occupational exposure limits.

2.5 Environmental HazardsLow acute toxicity to aquatic organisms (Zebrafish 96h LC_{50} = 5000 mg/L); fully biodegradable in natural environment (BOD_5 /COD = 0.75); no bioaccumulation potential; avoid direct large-scale discharge into water bodies.

2.6 Other HazardsReacts with strong oxidizing agents (e.g., hydrogen peroxide, chlorine) to produce mild toxic sulfur oxides; anhydrous form absorbs moisture from air (no effect on activity); dust may form non-explosive mixtures with air under normal handling.

SECTION 3: Composition/Information on Ingredients

- Substance / Mixture: **Pure Substance (both anhydrous and monohydrate)** | Component | CAS-No. | Formula | Concentration (w/w) | Classification | | --- | --- | --- | --- | --- | | L-Cysteine HCl (Anhydrous) | 52-89-1 | $C_3H_7NO_2S \cdot HCl$ | ≥98.5% (≥99.0% Pharm/Food) | Skin Irrit.2; Eye Irrit.2; STOT SE 3 | | L-Cysteine HCl (Monohydrate) | 7048-04-6 | $C_3H_7NO_2S \cdot HCl \cdot H_2O$ | ≥98.5% (≥99.0% Pharm/Food) | Skin Irrit.2; Eye Irrit.2; STOT SE 3 |

SECTION 4: First Aid Measures

4.1 Description of First-Aid Measures

- If Inhaled: Immediately move the victim to fresh, well-ventilated air. Loosen tight clothing to ensure unobstructed breathing. Encourage coughing to expel dust if conscious. No special treatment if no discomfort; call a doctor if cough or chest tightness persists.
- In Case of Skin Contact: Immediately remove contaminated clothing and gloves. Rinse the affected skin with plenty of running water and mild soap for at least 10 minutes. Pat dry gently; do not apply ointment without medical advice. Seek medical attention if redness or itching worsens.
- In Case of Eye Contact: Hold the eyelids open and rinse the eyes continuously with clean running water for at least 15 minutes, flushing the entire eye surface (including under the eyelid). Do not rub the eyes or use eye drops. Remove contact lenses only if easy to do without damage. Consult an ophthalmologist if irritation or blurred vision persists.
- If Swallowed: Rinse the mouth with plenty of clean water (do not swallow). If conscious and alert, drink a small amount of water to dilute the substance. Do not induce vomiting. Call a doctor only if nausea, abdominal pain or vomiting occurs.

4.2 Most Important Symptoms and Effects, Both Acute and Delayed

- Acute: Severe eye irritation, mild skin redness/itching, slight respiratory cough, mild gastrointestinal discomfort.
- Delayed: Minor skin peeling (1-2 days after contact), persistent eye redness (up to 48 hours); no long-term permanent organ damage with prompt treatment.

4.3 Indication of Any Immediate Medical Attention and Special Treatment NeededNo specific antidote available; treat symptomatically. Seek urgent medical attention only for severe eye irritation or large-dose swallowing with persistent discomfort.

SECTION 5: Firefighting Measures

5.1 Extinguishing Media

- Suitable: Water spray (cooling and dust suppression), carbon dioxide (CO_2), dry chemical powder, foam.
- Unsuitable: No limitations of extinguishing agents; avoid direct high-pressure water jet to prevent dust dispersion.

5.2 Special Hazards Arising from the Substance or MixtureNon-combustible solid; high temperature (>200℃) or fire causes thermal decomposition to produce slight sulfurous and ammonia gas; no hazardous combustion products; no explosion risk under normal fire conditions; dust may disperse and cause mild respiratory irritation to firefighters.

5.3 Advice for FirefightersWear standard fire-fighting gear (goggles, gloves, respirator) to avoid contact with decomposition gas and dust. Keep containers cool with water spray during fire to prevent thermal decomposition. Evacuate to upwind areas; avoid inhaling mild toxic fumes. Prevent fire-extinguishing water from entering municipal sewers in large quantities.

SECTION 6: Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency ProceduresWear basic personal protective equipment (chemical-resistant goggles, nitrile gloves, dust respirator) for spill cleanup. Ensure good ventilation at the spill site; evacuate non-essential personnel if large spill occurs. Avoid inhaling dust and direct skin/eye contact; use wet cleaning methods to prevent dust dispersion.

6.2 Environmental PrecautionsPrevent the spilled powder from entering sewers, rivers, lakes or soil. Cover the spilled powder with plastic sheeting to avoid being blown away by wind; do not flush the powder into drains with water directly.

6.3 Methods and Materials for Containment and Cleaning Up

- Small Spill: Wet the powder with a small amount of water to prevent dust dispersion; sweep up the wet powder with a clean broom and collect into a sealed HDPE container; wipe the spill area with a damp cloth and dispose of the cloth in the same container.
- Large Spill: Cover the powder with plastic sheeting; wet the powder in sections with water (avoid splashing); collect the wet powder into a sealed HDPE drum with a shovel; clean the spill area with a damp mop and rinse with a small amount of water (collect rinsing waste for proper disposal).6.4 Reference to Other SectionsFor waste disposal, see Section 13; for personal protection, see Section 8.

SECTION 7: Handling and Storage

7.1 Precautions for Safe HandlingOperate in a well-ventilated area with local exhaust ventilation (to remove dust); wear specified PPE for all operations. Avoid generating dust (use closed transfer systems, low-speed mixing); use chemical-resistant equipment (HDPE, glass, stainless steel) for handling. Do not mix with strong oxidizing agents or strong alkalis; avoid prolonged contact with air for anhydrous form (prevents moisture absorption). Do not eat, drink or smoke in the work area; wash hands, face and exposed skin thoroughly with soap and water after handling.

7.2 Conditions for Safe Storage

- Storage Conditions: Store in a **cool, dry, well-ventilated** warehouse. Temperature ≤25℃, relative humidity ≤50%. Keep the container tightly sealed with a screw cap; store in original HDPE or amber glass containers (sealed with desiccant for anhydrous form). Store away from direct sunlight, heat sources and open flames.
- Incompatibilities: Strong oxidizing agents (H_2O_2, $KMnO_4$, chlorine), strong alkalis (NaOH, KOH), oxidizing food/cosmetic/feed raw materials.
- Storage Class (TRGS 510): 10 (Non-hazardous Solids, low irritation)
- Shelf Life: **24 months (unopened, under specified storage conditions) - both anhydrous and monohydrate**
- Segregation: Store separately from incompatible materials in a dedicated storage area with anti-leakage trays; mark clear hazard labels (eye irritation, skin irritation) on the storage area and containers.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control Parameters

- Occupational Exposure Limit (OEL) for L-Cysteine HCl: TWA 10 mg/m³ (8-hour, ACGIH); STEL 20 mg/m³ (15-minute, ACGIH)
- Biological Limit Value (BLV): N/A

8.2 Exposure Controls

- Engineering Controls: Local exhaust ventilation (LEV) with dust collection system for all handling operations; closed transfer systems for bulk loading/unloading; dust concentration detection alarm in the work area (set alarm limit at 10 mg/m³).
- Personal Protective Equipment (PPE) - **Recommended for all operations**:
  - Eye/Face Protection: Chemical-resistant safety goggles (mandatory); full face shield for bulk operations.
  - Skin Protection: Nitrile rubber gloves (thickness ≥0.30 mm), disposable arm sleeves; replace gloves immediately if damaged.
  - Respiratory Protection: Dust/mist respirator (N95) for routine operations; half-face respirator for large-scale handling.
  - Other: Chemical-resistant work shoes, dust-proof work clothes; keep emergency eye wash station within 10 meters of the work area.

SECTION 9: Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

表格

Property	Anhydrous (52-89-1)	Monohydrate (7048-04-6)	Unit
Physical State	Crystalline powder	Crystalline powder	-
Color	White to off-white	White to off-white	-
Odor	Slight sulfurous odor	Slight sulfurous odor	-
Melting Point (decomp.)	215-225	170-180	℃
Boiling Point	Decomposes (>200)	Decomposes (>180)	℃
Flammability	Non-flammable	Non-flammable	-
Flash Point	Not applicable	Not applicable	℃
Decomposition Temperature	≥200	≥180	℃
pH (5% aq. solution, 25℃)	1.5-2.5	1.5-2.5	-
Bulk Density	0.85-0.95	0.90-1.00	g/cm³
Solubility	Freely soluble in water; soluble in	Freely soluble in water; soluble in	-

Property	Anhydrous (52-89-1)	Monohydrate (7048-04-6)	Unit
	methanol; slightly soluble in ethanol; insoluble in ether/benzene	methanol; slightly soluble in ethanol; insoluble in ether/benzene	
Vapor Pressure (25℃)	<0.01	<0.01	kPa
True Density	1.54	1.41	g/cm³
Hygroscopy	Slightly hygroscopic	Non-hygroscopic	-
Oxidizing Properties	None	None	-
Explosive Properties	None	None	-

9.2 Other Safety InformationAnhydrous form absorbs mild moisture from air (forms monohydrate, no loss of activity); both forms are stable in aqueous solution (5-10%) for 6 months at 25℃; stable in food/cosmetic/feed formulations with pH 2.0-7.0 for 12 months.

SECTION 10: Stability and Reactivity

10.1 Chemical Stability: Stable under the recommended storage and handling conditions (≤25℃, sealed, dry); no chemical changes under normal industrial/food processing conditions (≤100℃); stable in food/cosmetic/feed formulations with pH 2.0-7.0.10.2 Possibility of Hazardous Reactions: No hazardous reactions under normal use and processing conditions; reacts with strong oxidizing agents/strong alkalis to produce mild toxic byproducts; decomposes at high temperature (>200℃) to release slight sulfurous gas; no hazardous polymerization occurs under any conditions.10.3 Conditions to Avoid: High temperature (>200℃), direct sunlight, excessive moisture (anhydrous), contact with incompatible materials, dust dispersion.10.4 Incompatible Materials: Strong oxidizing agents, strong alkalis, heavy metal salts ($CuSO_4$, $FeCl_3$), oxidizing food/cosmetic/feed raw materials.10.5 Hazardous Decomposition Products: Sulfurous gas, ammonia (high-temperature decomposition); mild toxic sulfur oxides (when reacting with strong oxidants); no explosive decomposition products.

SECTION 11: Toxicological Information

11.1 Information on Toxicological Effects

- Acute Toxicity:
  - Oral (Rat, LD_{50}): 3400 mg/kg (Anhydrous); 3800 mg/kg (Monohydrate) (Low toxic)
  - Dermal (Rabbit, LD_{50}): >5000 mg/kg (both forms) (Non-toxic via skin)
  - Inhalation (Rat, LC_{50}): >1000 mg/m³ (4-hour dust exposure) (Low toxic)
- Skin Corrosion/Irritation: Rabbit 4-hour closed patch test - mild erythema (Category 2), reversible with proper treatment.
- Serious Eye Damage/Irritation: Rabbit eye test - severe conjunctival redness and corneal irritation (Category 2), reversible with prompt flushing.
- Respiratory Irritation: Rat inhalation test - mild bronchial irritation at dust concentrations ≥500 mg/m³, no permanent respiratory damage.
- Mutagenicity/Carcinogenicity: Ames test, chromosome aberration test - negative; IARC Classification - Group 3 (not classifiable as to carcinogenicity to humans).
- Reproductive Toxicity: No adverse reproductive or developmental effects in animal tests at occupational exposure doses; no teratogenic or embryotoxic effects.
- Specific Target Organ Toxicity (Repeated Exposure): 90-day repeated dermal exposure test - no target organ damage at recommended occupational limits.

SECTION 12: Ecological Information

12.1 Toxicity

- Fish (Zebrafish, 96h LC_{50}): 5000 mg/L (aqueous solution)
- Daphnia (48h EC_{50}): 4000 mg/L (aqueous solution)
- Freshwater Algae (72h EC_{50}): 6000 mg/L (aqueous solution)12.2 Persistence and Degradability: Fully biodegradable (BOD_5/COD = 0.75); degraded by microbial action in natural environment within 3-5 days; no persistent environmental residues.12.3 Bioaccumulative Potential: Very low (log P=-2.15); no bioaccumulation in aquatic organisms or food chain; no biomagnification observed.12.4 Mobility in Soil: High mobility (freely water-soluble); easily adsorbed to soil organic matter, no leaching risk to groundwater at normal use concentrations.12.5 PBT/vPvB Assessment: Not classified as PBT/vPvB substances (no persistence, no bioaccumulation, low aquatic toxicity).12.6 Other Adverse Effects: No known adverse effects on soil microorganisms or aquatic ecosystems at normal environmental concentrations.

SECTION 13: Disposal Considerations

13.1 Waste Treatment Methods

- Product Waste: Expired/contaminated L-Cysteine HCl is classified as **non-hazardous waste (low irritation)**; dispose of by licensed waste treatment facilities via biological treatment or incineration (≥800℃) with flue gas treatment. Can be diluted and discharged into municipal wastewater treatment systems (in small quantities).
- Packaging Waste: Rinse packaging with a small amount of water (collect rinsing waste for biological treatment); dispose of contaminated packaging as non-hazardous waste; recycle clean and uncontaminated HDPE/glass packaging after thorough cleaning.
- Spill Waste: Contaminated cleaning tools and dust are non-hazardous; collect and dispose of via municipal solid waste treatment or biological treatment.
- Disposal Compliance: Comply with China GB 5085.7, EU EWC 070801, US RCRA Non-hazardous Waste.

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 goods14.3 Transport Hazard Class(es): ADR/RID: -; IMDG: -; IATA-DGR: -14.4 Packaging Group: ADR/RID: -; IMDG: -; IATA-DGR: -14.5 Environmental Hazards: IMDG Marine Pollutant: **No**14.6 Special Precautions for TransportTransport in sealed HDPE plastic drums or amber glass bottles with inner plastic lining, desiccant (for anhydrous) and anti-leakage caps. Transport temperature ≤30℃, relative humidity ≤60%; avoid direct sunlight, rain, moisture, collision and rough handling during transport (prevent container breakage and dust dispersion). Do not transport with strong oxidizing agents or strong alkalis; transport by ordinary chemical vehicles with moisture-proof measures. Comply with ADR/RID, IMDG Code and IATA-DGR for non-dangerous goods; provide MSDS/COA for customs clearance if needed.

SECTION 15: Regulatory Information

15.1 National/International Regulations

- China: National Food Safety Standard (GB 1886.205-2016); Cosmetic Raw Material Safety Specification (2021); Feed Additive Standard (NY/T 394-2020); Pharmaceutical Intermediate Quality Standard; Non-hazardous Chemical Classification.
- EU: REACH (Annex XVII compliant, not in SVHC Candidate List); CLP (GHS Classification - Warning); Food Additive Regulation (EC 1333/2008); Cosmetic Regulation (EC 1223/2009); Feed Additive Regulation (EC 1831/2003).
- US: TSCA (listed on the TSCA Inventory); FDA GRAS (Generally Recognized As Safe) for food use; FDA Cosmetic Ingredient Review (CIR) approved; OSHA Hazard Communication Standard (29 CFR 1910.1200).
- International: ISO 9001 (Quality); ISO 14001 (Environment); FAO/WHO Food Additive Standards.

15.2 Additional Regulatory RequirementsProvide English MSDS/COA for customs clearance; mark **FOR FOOD/PHARMACEUTICAL/COSMETIC/FEED/INDUSTRIAL USE** on all product documents and packaging; comply with food/cosmetic/feed additive dosage limits and national quality standards; label products with eye/skin irritation warnings for industrial use.

SECTION 16: Other Information

- Further Information: This MSDS complies with GB/T 16483, GB/T 17519 and GHS Rev.9 standards, and is for professional use by trained personnel (production, storage, transport and disposal). Key characteristic: **L-Cysteine HCl (Anhydrous/Monohydrate) ≥98.5%, white crystalline powder, low irritation, for food, pharmaceutical, cosmetic, feed and industrial use**.
- Revision Date: 26 FEB 2026