Safety Data Sheet (MSDS)

- L-Proline

*(According to GB/T 16483 and GB/T 17519; Adapts to GHS, IMDG, IATA Standards)***Product Name**: L-Proline**Revision Date**: 29 FEB 2026

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

1.1 Product Identifiers

- Product Name: L-Proline
- Synonyms: L-Pyrrolidine-2-carboxylic acid; (S)-Pyrrolidine-2-carboxylic acid
- Product Number: L-PRO-20260229
- Brand: SIGALD
- CAS-No.: 147-85-3
- EINECS Number: 205-702-2
- Molecular Formula: $C_5H_9NO_2$
- Molecular Weight: 115.13 g/mol

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**: Amino acid nutritional fortifier for animal feed; food additive (flavor enhancer, nutrient fortifier); pharmaceutical intermediate (amino acid infusions, enteral nutrition, peptide synthesis); dietary supplement raw material; cosmetic ingredient (moisturizer, skin conditioner); cell culture medium component.
- **Uses Advised Against**: Industrial non-nutritional/non-pharmaceutical applications; direct injection without pharmaceutical grade purification.

SECTION 2: Hazards Identification

2.1 GHS Classification

- **Not Classified** as hazardous according to GHS criteria (GHS 0 category)

2.2 GHS Label Elements

- Hazard Pictogram: None
- Signal Word: None
- Hazard Statements: None
- Precautionary Statements: None (standard handling precautions apply)

2.3 Physical and Chemical Hazards

Non-flammable, non-explosive, non-corrosive, non-oxidizing. Slightly hygroscopic; may cause minor caking in high humidity environment. No dust explosion risk under normal handling conditions.

2.4 Health Hazards

- **Acute**: Generally regarded as safe (GRAS). Inhalation of large amounts of dust may cause mild respiratory/eye irritation in sensitive individuals; no systemic toxicity. Extremely excessive oral ingestion may cause mild gastrointestinal discomfort (bloating, nausea), no severe acute effects.

- **Chronic**: No known chronic health hazards with normal use; it is a non-essential amino acid (conditionally essential under stress) for humans/animals, a key component of protein synthesis with no cumulative toxicity.

2.5 Environmental Hazards

- Not hazardous to the environment; readily biodegradable, non-toxic to aquatic/terrestrial organisms, acts as a nutrient for microorganisms. No bioaccumulation, soil or water pollution potential.

2.6 Other Hazards

No additional hazards identified.

SECTION 3: Composition/Information on Ingredients

- **Substance**: Pure chemical compound (single amino acid)
- **Non-Hazardous Ingredient**:

Ingredient	CAS No.	Concentration (w/w)	GHS Classification
L-Proline	147-85-3	≥99.0% (Typical 99.7%)	Non-hazardous

SECTION 4: First Aid Measures

4.1 Description of First-Aid Measures

- **If Inhaled**: Move the victim to fresh air, rest in a comfortable position. Rinse mouth with water if needed. No special treatment required if no discomfort; consult a physician if coughing/irritation persists.
- **In Case of Skin Contact**: Wipe off excess powder with a dry cloth, rinse skin with running water and mild soap if desired. No adverse skin effects expected; no special treatment needed.
- **In Case of Eye Contact**: Rinse eyes thoroughly with plenty of running water for 5-10 minutes, holding eyelids open. Remove contact lenses if present. Consult a physician only if irritation/redness persists for more than 24 hours.
- **If Swallowed**: Rinse mouth with water. Do not induce vomiting. The product is safe for oral consumption; consult a physician only if severe gastrointestinal discomfort occurs after excessive ingestion.

4.2 Most Important Symptoms and Effects

- **Acute**: Mild transient eye/respiratory irritation from dust; mild GI upset from extreme overconsumption. No severe acute toxic effects.
- **Delayed**: No known delayed toxic effects based on current scientific data.

4.3 Indication of Immediate Medical Attention

No specific medical treatment required; treat symptomatically if mild irritation/discomfort occurs.

SECTION 5: Firefighting Measures

5.1 Extinguishing Media

- **Suitable**: Water spray, dry chemical powder, carbon dioxide (CO_2), foam.
- **Unsuitable**: No limitations; all common extinguishing agents are effective.

5.2 Special Hazards Arising from the Substance

Non-flammable. At extremely high temperatures (>300℃), combustion may produce minor amounts of carbon monoxide (CO), nitrogen oxides (NO_x) and water vapor; no other hazardous combustion products. No toxic fumes generated at normal processing temperatures.

5.3 Advice for Firefighters

Wear standard fire-fighting protective gear (helmet, fire coat, gloves). Cool storage containers with water spray if exposed to fire/high temperatures to prevent thermal degradation. No special respiratory protection needed unless heavy smoke is present.

SECTION 6: Accidental Release Measures

6.1 Personal Precautions

For small spills: No special PPE required. For large spills: Wear disposable dust mask and nitrile gloves to avoid dust inhalation and minor skin contact; ensure good ventilation in the spill area.

6.2 Environmental Precautions

No special environmental precautions; the product is biodegradable and non-toxic to the environment. Avoid direct discharge into large water bodies only for the purpose of product recovery.

6.3 Methods for Containment and Cleaning Up

- **Small Spill**: Sweep or wipe up with a dry cloth, transfer to a sealed container for reuse or disposal as non-hazardous waste.
- **Large Spill**: Dampen the powder with a small amount of water to prevent dust dispersion, then sweep into sealed HDPE drums for recycling or disposal. Clean the spill area with water and dry thoroughly.

6.4 Reference to Other Sections

For waste disposal, see Section 13.

SECTION 7: Handling and Storage

7.1 Precautions for Safe Handling

- Operate in a well-ventilated area; minimize dust generation during pouring/mixing (avoid violent agitation).
- Use dry equipment for handling to prevent caking due to moisture absorption.
- Hygiene Measures: Wash hands thoroughly with water and soap after handling; maintain normal food processing hygiene standards for food/feed/pharm grade use.
- Avoid contact with strong acids/alkalis at high temperatures (>80℃) to prevent amino acid degradation.

7.2 Conditions for Safe Storage

- **Storage Temperature**: 5-30℃, store in a cool, dry, well-ventilated warehouse.
- **Humidity Control**: Relative humidity ≤60%; keep containers tightly sealed to prevent moisture absorption and caking.
- **Protection**: Avoid direct sunlight, high temperature (>35℃) and damp environments.
- **Incompatibilities**: Strong oxidizing agents, concentrated strong acids/alkalis (at temperatures >80℃), heavy metal salts.
- **Shelf Life**: 36 months (unopened, under the specified storage conditions).

SECTION 8: Exposure Controls/Personal Protection

8.1 Control Parameters

No official occupational exposure limits (OEL) for L-Proline; it is a GRAS food/feed ingredient with no toxic exposure risk.

8.2 Exposure Controls

- **Engineering Controls**: Basic general ventilation is sufficient for normal handling. Local exhaust ventilation is optional for large-scale bulk handling to reduce dust concentration.
- **Personal Protective Equipment (PPE)**:
  - Eye/Face: Safety glasses with side shields recommended for bulk handling to prevent powder from entering eyes.
  - Skin: Nitrile/latex gloves for hygiene purposes (mandatory for food/feed/pharmaceutical production).
  - Respiratory: Disposable dust mask for large spills/bulk mixing (to avoid dust inhalation); not required for normal use.

- Other: Lab coat/apron recommended for industrial handling to prevent powder contamination of clothing.

8.3 Hygiene Measures

Provide hand wash and eye rinse facilities in the workplace; follow GMP/food safety hygiene protocols for food/feed/pharm grade production. Launder contaminated clothing before reuse.

SECTION 9: Physical and Chemical Properties

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Property	Details
Physical State	White crystalline free-flowing powder
Color	White to off-white
Odor	Odorless or faint characteristic amino acid odor
Taste	Mild sweet taste
Melting Point	220-222℃ (decomposition)
Boiling Point	Not applicable (decomposes before boiling)
Flash Point	>300℃ (Non-flammable)
Autoignition Temperature	Not applicable (non-flammable)
Relative Density (20℃)	1.350 g/cm³
Bulk Density	0.60-0.75 g/cm³
Solubility (25℃)	Freely soluble in water (≈360 g/L); slightly soluble in ethanol; insoluble in ether, acetone, benzene
pH Value (5% aqueous solution, 25℃)	5.5-6.5
Specific Rotation (20℃, 5% in H_2O)	-84.0° to -88.0°
Hygroscopy	Slightly hygroscopic (absorbs moisture in RH >70%)
Viscosity	Not applicable (solid powder)
Decomposition Temperature	≥220℃
Explosive Properties	None
Oxidizing Properties	None

SECTION 10: Stability and Reactivity

10.1 Chemical Stability

Stable under recommended storage and handling conditions (5-30℃, dry, sealed). Excellent stability to heat processing typical in food/feed production (pelleting, extrusion, pasteurization up to 121℃ for 30mins with no significant degradation). Stable in neutral to slightly acidic/basic pH range (4.0-8.0).

10.2 Possibility of Hazardous Reactions

No hazardous polymerization, decomposition, or violent chemical reactions under normal use and storage conditions.

10.3 Conditions to Avoid

Prolonged exposure to high temperature (>220℃), high humidity (RH>70%), concentrated strong acids/alkalis, strong oxidizing agents, and direct sunlight.

10.4 Incompatible Materials

Concentrated nitric acid, hydrogen peroxide (high concentration), sodium hydroxide solution (≥20%), potassium permanganate, heavy metal chlorides/sulfates.

10.5 Hazardous Decomposition Products

Complete combustion at high temperature produces carbon dioxide, water vapor, and minor nitrogen oxides; no toxic or corrosive decomposition products at normal processing/storage temperatures.

SECTION 11: Toxicological Information

11.1 Information on Toxicological Effects

- **Acute Toxicity**: LD_{50} (Oral, Rat) >15,000 mg/kg; LD_{50} (Dermal, Rabbit) >20,000 mg/kg; Inhalation (Rat, LC_{50}) >50 mg/m³ (4h exposure) – **Practically non-toxic**.
- **Skin Corrosion/Irritation**: Non-irritating to skin (Rabbit 4-hour patch test; no redness/edema).
- **Serious Eye Damage/Eye Irritation**: Slightly irritating only if large powder quantities remain in the eye (reversible redness; no permanent damage).
- **Respiratory/Skin Sensitization**: No sensitizing effects (no reported cases in humans/animals).
- **Germ Cell Mutagenicity**: No mutagenic potential (Ames test, chromosome aberration test negative).
- **Carcinogenicity**: IARC Group 3 (Not classifiable as to carcinogenicity to humans); no carcinogenic potential in animal studies.
- **Reproductive Toxicity**: No adverse effects on fertility, pregnancy, or fetal development (animal studies with oral exposure up to 8000 mg/kg/day); it is a beneficial nutrient for fetal/neonatal growth and development.
- **Specific Target Organ Toxicity**: No target organ toxicity with normal consumption/handling.
- **Aspiration Hazard**: Low (solid powder with moderate bulk density; no aspiration risk under normal use).

11.2 Additional Information

L-Proline is a non-essential amino acid that can be synthesized by humans and most livestock; it becomes conditionally essential under stress, injury, or rapid growth conditions. It is a critical component of collagen and connective tissue synthesis with no toxicological effects at normal nutritional doses.

SECTION 12: Ecological Information

12.1 Toxicity

Non-toxic to all aquatic/terrestrial organisms:

- Fish (Zebrafish, LC_{50}): >5000 mg/L (96h exposure)
- Daphnia (EC_{50}): >2000 mg/L (48h exposure)
- Algae (EC_{50}): >5000 mg/L (72h exposure)
- Soil microbes: No inhibitory effect; acts as a nutritional substrate.

12.2 Persistence and Degradability

Readily biodegradable (>90% degradation in 28 days) by microorganisms in water and soil; no environmental persistence.

12.3 Bioaccumulative Potential

None (highly water-soluble amino acid with no lipophilicity; BCF <10 in fish studies); no biomagnification in aquatic food chains.

12.4 Mobility in Soil

High mobility (water-soluble) but rapidly degraded by soil microbes; no leaching or soil accumulation risk.

12.5 PBT/vPvB Assessment

Not classified as PBT/vPvB (meets biodegradability, low toxicity and no bioaccumulation criteria).

12.6 Other Adverse Effects

No eutrophication risk (no excess nitrogen/phosphorus); no adverse effects on ecological systems. Acts as a beneficial nutrient for soil microorganisms and promotes soil microecology balance.

SECTION 13: Disposal Considerations

13.1 Waste Treatment Methods

- **Product Waste**: Dispose of as non-hazardous food/feed/pharmaceutical waste. Uncontaminated powder can be recycled/reused. Contaminated powder can be discharged to municipal sewage systems (biodegradable) or sent to non-hazardous solid waste treatment facilities.
- **Packaging Waste**: Rinse empty packaging with water to remove residual powder, then dispose of as recyclable waste (paper/plastic/HDPE) or non-hazardous solid waste.
- **Spilled Waste**: Collected spilled powder can be reused if not contaminated; contaminated spill waste is disposed of as non-hazardous waste.

13.2 Disposal Notes

Comply with local, national, and international waste disposal regulations (e.g., China GB 18599, EU WFD, US RCRA). No special disposal requirements for this non-hazardous product.

SECTION 14: Transport Information

- **UN Number**: ADR/RID: -; IMDG: -; IATA-DGR: - (**Not dangerous goods**)
- **UN Proper Shipping Name**: ADR/RID: Not dangerous goods; IMDG: Not dangerous goods; IATA-DGR: Not dangerous goods
- **Transport Hazard Class**: ADR/RID: -; IMDG: -; IATA-DGR: -
- **Packaging Group**: ADR/RID: -; IMDG: -; IATA-DGR: -
- **Marine Pollutant**: No (IMDG Code)
- **Special Precautions for User**:

1. Transport as food/feed/pharm grade cargo; use sealed, moisture-proof packaging to prevent caking and contamination.
2. Avoid transport in damp, high-temperature (>35℃) or direct sunlight conditions; use dry, cool closed vehicles.
3. Avoid mixing with strong oxidants, concentrated acids/alkalis, and hazardous chemicals during transport.
4. No special transport documentation required (non-dangerous goods); provide COA for food/feed/pharm grade cargo upon request.

SECTION 15: Regulatory Information

15.1 National/International Regulations

- **China**: Compliant with GB 2760-2021 (Food Additive), Chinese Pharmacopoeia (CP) 2020 (Pharm Grade); approved as an amino acid fortifier for food/feed/cosmetics.
- **US**: FDA GRAS; listed in TSCA Inventory; compliant with 21 CFR for food/dietary supplement/feed/cosmetic use; Kosher certified.
- **EU**: REACH Registered; compliant with EC 1333/2008 (Food Additives), EC 1831/2003 (Feed Additives), EC 1223/2009 (Cosmetics Regulation); Halal certified; meets EFSA nutritional standards.
- **Codex Alimentarius**: Compliant with Codex standards for amino acid food ingredients.

15.2 Other Regulations

Compliant with GMP (Good Manufacturing Practice) for food/feed/pharmaceutical/cosmetic production; meets international food safety standards (HACCP, ISO 22000) and cosmetic safety standards (ISO 22716).

SECTION 16: Other Information

16.1 Further Information

This product is a natural L-isomer proline produced by advanced microbial fermentation and high-precision purification; it is a key amino acid for collagen, elastin and connective tissue synthesis, and also acts as an osmoprotectant for cells under stress conditions. It has excellent moisturizing properties for cosmetic applications and high bioavailability for nutritional supplementation.

16.2 Revision Note

First issue of MSDS for L-Proline (CAS 147-85-3) of brand SIGALD, complying with GB/T 16483, GB/T 17519, GHS Rev.9, IMDG and IATA standards.

16.3 Disclaimer

This MSDS is based on current scientific and regulatory data. The supplier is not liable for any damage caused by improper use, non-compliance with storage/handling precautions, or unauthorized mixing with incompatible materials.