Safety Data Sheet (MSDS)

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

Product Name: Tirzepatide**CAS-No.**: 2023788-19-2**Product Number**: TIR-20260222**Brand**: SIGALD**Revision Date**: 22 FEB 2026

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

1.1 **Product Identifiers**

- Synonyms: (L-Alanyl)-γ-glutamyl-L-a-aspartyl-L-seryl-L-lysyl-L-seryl-L-prolyl-L-threonyl-; Dual GIP/GLP-1 receptor agonist
- 1.2 **Supplier Details**
- 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**: +86-021-50350029 (CHEMTREC)
- 1.4 **Identified Uses & Uses Advised Against**
- Identified Uses: Pharmaceutical raw material (dual GIP/GLP-1 receptor agonist; anti-diabetic/obesity treatment); biomedical research reagent for peptide pharmacology.
- Uses Advised Against: Not for direct injection/oral use (unformulated); no unapproved industrial/cosmetic/food use; avoid use in patients with thyroid C-cell tumors.

SECTION 2: Hazards Identification

2.1 **GHS Classification**: Acute oral toxicity, Category 4 (H302); Eye irritation, Category 2 (H319); Specific target organ toxicity (single exposure), Category 3 (Gastrointestinal tract) (H335)2.2 **GHS Label Elements**

- Hazard Pictogram: (Warning)
- Signal Word: **Warning**
- Hazard Statements: H302 - Harmful if swallowed; H319 - Causes serious eye irritation; H335 - May cause respiratory irritation
- Precautionary Statements: P261, P270, P280, P305+P351+P338, P312, P332+P3132.3 **Physical and Chemical Hazards**: No physical/chemical hazards; non-combustible; highly hygroscopic2.4 **Health Hazards**: Harmful if swallowed; causes serious eye irritation; mild respiratory irritation via dust inhalation; gastrointestinal discomfort (nausea/vomiting) on accidental ingestion; potential thyroid C-cell tumor risk in long-term high-dose animal exposure.2.5 **Environmental Hazards**: Non-toxic to aquatic organisms; fully biodegradable via enzymatic hydrolysis; no environmental pollution risk.2.6 **Other Hazards**: High hygroscopy (degrades on moisture absorption); no additional hazards identified.

SECTION 3: Composition/Information on Ingredients

- **Substance / Mixture**: Pure peptide substance

- **Active Component**: Tirzepatide (CAS:2023788-19-2) | Concentration: ≥99.0% | Classification: Acute oral toxicity Cat.4; Eye irritation Cat.2

SECTION 4: First Aid Measures

4.1 **First-Aid Measures**

- Inhaled: Move to fresh air; rest in comfortable breathing position; rinse nasal cavity with clean water; consult a doctor if cough/chest discomfort persists.
- Skin Contact: Rinse skin with running water for 5-10 mins; remove contaminated clothing; no special treatment (peptide is skin-inert).
- Eye Contact: Rinse eyes thoroughly with sterile water for 15-20 mins (hold eyelids open); remove contact lenses; **immediately consult an ophthalmologist**.
- Swallowed: Rinse mouth with water; **do not induce vomiting**; call a poison control center/consult a doctor at once; monitor gastrointestinal function.4.2 **Symptoms**: Nausea/vomiting/abdominal pain (ingestion); eye burning/tearing/blurred vision; mild nasal irritation/cough (inhalation); no skin irritation symptoms.4.3 **Medical Attention**: Symptomatic treatment; no specific antidote; supportive care for gastrointestinal discomfort; professional ophthalmic treatment for eye irritation.4.4 **Notes to Physician**: Inform of product composition (dual GIP/GLP-1 agonist peptide) and exposure/ingestion amount; monitor thyroid function for high-dose exposure.

SECTION 5: Firefighting Measures

5.1 **Extinguishing Media**: Water spray, foam, CO_2, dry powder (all suitable)5.2 **Special Hazards**: Non-combustible; decomposes at >150℃ (ambient)/>100℃ (vacuum) into non-toxic amino acids; no toxic combustion/decomposition fumes generated.5.3 **Firefighter Advice**: Wear standard fire-fighting gear (no SCBA required); cool containers with water spray to prevent moisture absorption/peptide degradation; no toxic fume inhalation risk.

SECTION 6: Accidental Release Measures

6.1 **Personal Precautions**: Wear N95 dust mask, chemical safety goggles, nitrile gloves and clean lab coat; operate in low-humidity (RH ≤40%) ventilated area (hygroscopic risk).6.2 **Environmental Precautions**: No special measures needed; spilled peptide is biodegradable by soil/water microorganisms; no environmental pollution.6.3 **Clean Up Methods**

- Small Spill: Sweep up with dry clean spatula; transfer to sealed moisture-proof container for reprocessing/disposal (avoid high-value peptide waste).
- Large Spill: Contain with anhydrous inert material (anhydrous silica gel); collect into sealed vacuum container; rinse area with small amount of anhydrous ethanol (collect rinse for disposal).6.4 **Reference**: See Section 13 for disposal details.

SECTION 7: Handling and Storage

7.1 **Safe Handling**

- Operate in a **low-humidity clean room (RH ≤40%)**; use dry sterile equipment; avoid dust generation/inhalation and eye contact.

- Do not eat/drink/smoke in the work area; wash hands thoroughly with water after handling; no special skin protection required.
- Avoid contact with water/moisture, strong acids/bases and proteolytic enzymes to prevent peptide hydrolysis/degradation.7.2 **Safe Storage**
- Storage Conditions: **Ultra-low temperature (-20℃±5℃)**, dry, dark, vacuum-sealed; secondary packaging with anhydrous desiccant; avoid repeated freeze-thaw cycles.
- Incompatibilities: Water/moisture, strong acids (pH <2), strong bases (pH >10), proteolytic enzymes (trypsin/pepsin), high temperature.
- Storage Class (TRGS 510): 10 (Toxic Solids, Non-combustible)
- Shelf Life: 24 months (unopened, -20℃ vacuum storage); 7 days (4℃ refrigerated, after opening)
- Storage Segregation: Store separately from water-containing reagents, proteolytic enzymes, food/feed; store in dedicated peptide ultra-low temperature freezer.

SECTION 8: Exposure Controls/Personal Protection

8.1 **Control Parameters**

- Occupational Exposure Limit (OEL): No official national limit; recommended TWA: 0.1 mg/m³ (inhalable dust)8.2 **Exposure Controls**
- Engineering Controls: Low-humidity clean room (RH ≤40%); local exhaust ventilation (LEV) for dust-generating operations; anhydrous air supply system.
- Personal Protective Equipment (PPE)
  - Eye/Face: Chemical safety goggles (mandatory)
  - Skin: Powder-free nitrile rubber gloves (≥0.18mm); disposable clean lab coat
  - Respiratory: N95/P95 dust mask for routine handling; PAPR for large-scale powder handling
  - Hand: Powder-free nitrile gloves (no latex)
- Hygiene: Change contaminated lab coat immediately; wash hands with water after handling; no special hygiene measures (peptide is non-toxic via skin).

SECTION 9: Physical and Chemical Properties

- Physical State: Amorphous lyophilized powder
- Color: White to off-white
- Odor: Odorless
- Melting Point: Decomposes (≥150℃ ambient; ≥100℃ vacuum)
- Boiling Point: N/A (decomposes before boiling)
- Flammability: Non-combustible
- Flash Point: N/A
- Autoignition Temperature: >300℃
- Solubility: Soluble in water (pH 4.0-7.0), DMSO, dilute acetic acid; insoluble in non-polar organic solvents (hexane/ether)
- Density (25℃): 1.23 g/cm³

- Particle Size: 200-300 mesh (pharmaceutical grade)
- Explosive Properties: Non-explosive
- Oxidizing Properties: None
- pH Value: 5.0-7.0 (1mg/mL aqueous solution, 25℃)
- Viscosity: N/A (solid); 6-10 mPa·s (10mg/mL aqueous solution)
- Hygroscopy: High (absorbs moisture at RH >40%)
- Vapor Pressure (25℃): < 0.1 hPa

SECTION 10: Stability and Reactivity

10.1 **Chemical Stability**: Stable at -20℃ vacuum/dry storage; stable at 4℃ for 7 days (after opening); degrades rapidly at room temperature/moisture.10.2 **Hazardous Reactions**: No hazardous reactions; hydrolyzes in water/enzymes to non-toxic amino acids; degrades in strong acids/bases.10.3 **Conditions to Avoid**: Moisture (RH >40%), high temperature (>25℃), repeated freeze-thaw, strong acids/bases, proteolytic enzymes.10.4 **Incompatible Materials**: Excess water, concentrated HCl/H_2SO_4, NaOH/KOH, trypsin/pepsin, papain, hydrogen peroxide.10.5 **Decomposition Products**: Non-toxic amino acids (no toxic byproducts); no hazardous decomposition products.

SECTION 11: Toxicological Information

11.1 **Toxicological Effects**

- Acute Toxicity: Oral (Rat, LD_{50}) = 3500 mg/kg; Dermal (Rabbit, LD_{50}) >5000 mg/kg; Inhalation (Rat, LC_{50}) >2 mg/m³ (4h)
- Skin Irritation/Corrosion: No irritation (Rabbit, 24h exposure; peptide is skin-inert)
- Eye Irritation/Damage: Severe irritation (Rabbit, 24h exposure; reversible with treatment)
- Respiratory/Skin Sensitization: No sensitizing effects (human/animal tests)
- Mutagenicity: No mutagenic effects (Ames test, chromosome aberration test)
- Carcinogenicity: Thyroid C-cell tumors in long-term high-dose animal tests; no confirmed human carcinogenicity data
- Reproductive Toxicity: No adverse effects at therapeutic dosages; avoid high-dose exposure during pregnancy/lactation
- Target Organ Toxicity: Gastrointestinal tract (acute ingestion); thyroid gland (long-term high-dose animal exposure)

SECTION 12: Ecological Information

12.1 **Toxicity**: Fish (Zebrafish, LC_{50}) >1000 mg/L (96h); Daphnia (EC_{50}) >1000 mg/L (48h); Algae (EC_{50}) >1000 mg/L (72h); non-toxic to aquatic life12.2 **Persistence and Degradability**: Fully biodegradable (100% hydrolysis) by aquatic/soil microorganisms; degradation half-life = 2-3 days (ambient temperature)12.3 **Bioaccumulative Potential**: None (hydrolyzes to amino acids; no bioaccumulation in food chains)12.4 **Mobility in Soil**: High mobility (soluble in soil water); hydrolyzed by soil microorganisms; no leaching risk (non-toxic)12.5 **PBT/vPvB**: Not classified as

PBT/vPvB; non-persistent, non-bioaccumulative, non-toxic12.6 **Other Effects**: No adverse ecological impacts; hydrolyzed amino acids act as soil nutrients; promotes microbial growth.

SECTION 13: Disposal Considerations

13.1 **Waste Treatment**: High-value waste: reprocess via lyophilization for reuse; Low-value waste: incinerate at >800℃ via licensed hazardous waste facilities (non-toxic ash); Aqueous waste: dilute 1:100 and discharge to biological wastewater treatment system (biodegradable).13.2 **Packaging Waste**: Rinse with anhydrous ethanol; dry thoroughly; dispose as non-hazardous plastic/glass waste; recycle dedicated peptide packaging.

SECTION 14: Transport Information

14.1 **UN Number**: ADR/RID/IMDG/IATA: 281114.2 **UN Proper Shipping Name**: Toxic solids, organic, n.o.s. (Tirzepatide)14.3 **Transport Hazard Class**: 6.1 (Toxic substances)14.4 **Packaging Group**: III14.5 **Environmental Hazards**: IMDG: Marine pollutant (No)14.6 **Special Precautions**: **Mandatory cold chain transport (-20℃±5℃)**; vacuum-sealed packaging with anhydrous desiccant; styrofoam cooler with dry ice; mark **"Do Not Thaw/Refreeze"**; avoid temperature fluctuation, collision, moisture.14.7 **Incompatible Materials**: Avoid transport with water-containing products, proteolytic enzymes, strong acids/bases, food/feed.

SECTION 15: Regulatory Information

15.1 **National & International Regulations**

- China: CP compliant; Hazardous Chemical Safety Management Regulation (Class 6.1); Pharmaceutical Raw Material Management Regulation (GMP grade)
- International: GHS (Rev.9) Cat.4 Acute oral toxicity; REACH (EU) Registered; TSCA (US) Listed; USP/EP/FDA compliant; FDA-approved for T2DM and obesity treatment15.2 **Other**: Comply with local pharmaceutical import/export, cold chain transport and hazardous chemical regulations; mark for thyroid C-cell tumor risk (animal test).

SECTION 16: Other Information

- This MSDS is based on current scientific research and complies with GB/T 16483, GB/T 17519 and GHS international standards.
- Supplier is not liable for damage caused by improper use, non-cold chain storage/transport or non-compliance with safety precautions.
- Pharmaceutical grade Tirzepatide meets global pharmacopoeia standards; for formulated injectable pharmaceutical products only (GMP conditions).
- For further technical/safety information, contact the supplier's peptide R&D/EHS department (cold chain guidance provided).