RESEARCH USE ONLY

LOTI LABS

Tirzepatide

Safety Data Sheet

CAS	2023788-19-2
Formula	C225H348N48O68
Molecular weight	4813 g/mol
DOCUMENT ID	LL-SDS-TIRZEPATIDE-001
REVISION DATE	2026-10-22
VERSION	1.8

01. Identification

Product identifier	Tirzepatide
Other means of identification	Tirzepatide; PubChem CID 166567236. Loti Labs catalog listing(s) covered by this SDS: Tirz 5mg (GLP-2); Tirz 10mg (GLP-2); Tirz 30mg (GLP-2); Tirz 50mg (GLP-2).
CAS number	2023788-19-2
Molecular formula	C225H348N48O68
Sequence	The full sequence and modified-residue identity are given in the PubChem record cited in Section 1 and Section 16. The batch COA does not print a sequence.
IUPAC name	20-[[(1S)-4-[2-[2-[2-[2-[2-[2-[[(5S)-5-[[(2S)-5-amino-2-[[(2S)-2-[[(2S,3S)-2-[[(2S)-6-amino-2-[[(2S)-2-[[(2S)-2-[[2-[[(2S,3S)-2-[[(2S)-2-[[(2S)-2-[[(2S)-2-[[(2S)-2-[[(2S,3R)-2-[[(2S)-2-[[(2S,3R)-2-[[2-[[(2S)-2-[[2-[[(2S)-2-amino-3-(4-hydroxyphenyl)propanoyl]amino]-2-methylpropanoyl]amino]-4-carboxybutanoyl]amino]acetyl]amino]-3-hydroxybutanoyl]amino]-3-phenylpropanoyl]amino]-3-hydroxybutanoyl]amino]-3-hydroxypropanoyl]amino]-3-carboxypropanoyl]amino]-3-(4-hydroxyphenyl)propanoyl]amino]-3-hydroxypropanoyl]amino]-3-methylpentanoyl]amino]-2-methylpropanoyl]amino]-4-methylpentanoyl]amino]-3-carboxypropanoyl]amino]hexanoyl]amino]-3-methylpentanoyl]amino]propanoyl]amino]-5-oxopentanoyl]amino]-6-[[(2S)-1-[[(2S)-1-[[(2S)-1-[[(2S)-5-amino-1-[[(2S)-1-[[(2S)-1-[[(2S,3S)-1-[[(2S)-1-[[2-[[2-[(2S)-2-[[(2S)-1-[[(2S)-1-[[2-[[(2S)-1-[(2S)-2-[(2S)-2-[(2S)-2-[[(2S)-1-amino-3-hydroxy-1-oxopropan-2-yl]carbamoyl]pyrrolidine-1-carbonyl]pyrrolidine-1-carbonyl]pyrrolidin-1-yl]-1-oxopropan-2-yl]amino]-2-oxoethyl]amino]-3-hydroxy-1-oxopropan-2-yl]amino]-3-hydroxy-1-oxopropan-2-yl]carbamoyl]pyrrolidin-1-yl]-2-oxoethyl]amino]-2-oxoethyl]amino]-1-oxopropan-2-yl]amino]-3-methyl-1-oxopentan-2-yl]amino]-4-methyl-1-oxopentan-2-yl]amino]-3-(1H-indol-3-yl)-1-oxopropan-2-yl]amino]-1,5-dioxopentan-2-yl]amino]-3-methyl-1-oxobutan-2-yl]amino]-1-oxo-3-phenylpropan-2-yl]amino]-1-oxopropan-2-yl]amino]-6-oxohexyl]amino]-2-oxoethoxy]ethoxy]ethylamino]-2-oxoethoxy]ethoxy]ethylamino]-1-carboxy-4-oxobutyl]amino]-20-oxoicosanoic acid
Recommended use	Research laboratory chemical for in-vitro scientific research and development.

Restrictions on use	Not for human or veterinary use. Not for food, drug, cosmetic, household, agricultural, clinical, therapeutic, or diagnostic applications.

Supplier details

Company	Loti Labs
Address	1204 S Broad St, Brooksville, FL 34601, United States
Telephone	877-LOTI-LAB
Website	https://lotilabs.com/
Emergency contact	CHEMTREC
Emergency phone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 hours/day; 7 days/week

02. Hazard(s) identification

OSHA classification Carcinogenicity, Category 2; Reproductive toxicity, Category 2. Classification is based on active-ingredient animal evidence cited in Sections 11 and 16 for the supplied substance.

Signal word	Warning
Hazard pictograms	GHS08 (health hazard)
Hazard statements	H351 Suspected of causing cancer. H361 Suspected of damaging fertility or the unborn child.
Hazards not otherwise classified	Toxicological properties have not been fully investigated. Fine powder may cause mechanical irritation. Treat as a potentially bioactive substance of unknown toxicity.
Unknown acute toxicity	No quantitative oral, dermal, or inhalation acute-toxicity data identified.

Precautionary statements

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P308+P313 IF exposed or concerned: Get medical advice/attention.

P405 Store locked up.

P264 Wash hands and exposed skin thoroughly after handling.

P280 Wear protective gloves, protective clothing, and eye protection.

P501 Dispose of contents/container in accordance with applicable regulations.

These precautionary statements are label elements for the hazard classification stated above, supplemented by P264 for prudent handling.

03. Composition / information on ingredients

Component	CAS	Formula	MW	Concentration
Tirzepatide parent peptide	2023788-19-2	C225H348N48O68	4813 g/mol	Research-grade lyophilized peptide; the batch COA reports identity, HPLC purity and peptide content; the counter-ion form is not reported on the COA

This SDS describes the parent-peptide identity shown in the composition table. Lot-specific identity, purity and peptide content are documented on the batch Certificate of Analysis; counter-ion, water and residual-solvent content are not reported on the COA.

No excipients are intentionally added; counter-ion and residual-solvent content are not reported on the batch Certificate of Analysis.

04. First-aid measures

Inhalation	Move person to fresh air. Keep at rest. Obtain medical advice if symptoms develop or persist.
Skin contact	Remove contaminated clothing. Wash thoroughly with soap and water. Seek medical advice if irritation develops.
Eye contact	Rinse cautiously with water for at least 15 minutes. Remove contact lenses if easy to do. Continue rinsing. Obtain medical attention if irritation persists.
Ingestion	Rinse mouth. Do not induce vomiting unless directed by medical personnel. Contact a poison center or physician if swallowed or symptoms occur.
Most important symptoms/effects	Systemic absorption may cause nausea, vomiting, diarrhea and low blood sugar (prescribing information); no occupational exposure data are available. Delayed: suspected carcinogenic and reproductive effects (H351, H361; see Section 11). Dust may cause mechanical irritation.
Immediate medical attention	Treat symptomatically. No specific antidote known.

05. Fire-fighting measures

Suitable extinguishing media	Water spray, dry chemical, carbon dioxide, or foam appropriate to the surrounding fire.
Unsuitable extinguishing media	No substance-specific restriction identified. Avoid methods that disperse dust.
Specific hazards	Organic nitrogen-containing solid. Thermal decomposition may generate carbon oxides and nitrogen oxides.
Protective equipment	Firefighters should wear full protective equipment and positive-pressure self-contained breathing apparatus.

06. Accidental release measures

Personal precautions

Restrict access. Avoid dust formation and all contact. Ensure adequate ventilation. Wear PPE described in Section 8.

Environmental precautions

Prevent release to drains, sewers, surface water, and soil.

Containment and cleanup

Gently collect without raising dust using suitable tools or a HEPA-filtered vacuum. Place in a sealed, labeled container. Clean affected surfaces and dispose of waste in accordance with Section 13.

Avoid dry sweeping; use damp wiping if a HEPA-filtered vacuum is unavailable.

07. Handling and storage

Precautions for safe handling

Handle as a potentially bioactive research substance of unknown toxicity. Conduct weighing, transfer, and reconstitution in a certified chemical fume hood, ventilated balance enclosure, or other effective containment. Avoid generating or breathing dust or aerosols. Avoid eye, skin, and clothing contact. Do not eat, drink, smoke, or apply cosmetics in work areas. Wash thoroughly after handling. Keep containers closed when not in use.

Storage conditions

Store tightly closed, dry, and protected from light and moisture. For the lyophilized material, follow the storage condition shown on the product label. Long-term storage of dry peptides is commonly at −20 °C or colder; do not assign a shelf life beyond supplier documentation. Allow a cold vial to equilibrate to room temperature before opening to reduce condensation. Aliquot reconstituted solutions to minimize freeze to thaw cycles.

Incompatibilities

Strong oxidizing agents, strong acids, strong bases, excessive heat, moisture, direct sunlight, and ultraviolet light.

Do not store reconstituted solutions beyond a laboratory-established stability period.

08. Exposure controls / personal protection

Occupational exposure limits

No OSHA PEL, NIOSH REL, or ACGIH TLV identified for Tirzepatide. Maintain exposure as low as reasonably achievable.

Engineering controls

Use local exhaust ventilation or a certified containment device for open handling of powder. Larger-scale work should use closed transfer or glovebox/isolator controls. Provide an accessible eyewash and safety shower. Apply the hierarchy of controls required by site risk assessment.

Personal protective equipment

Eye / face protection	Safety glasses with side shields as a minimum; chemical splash goggles for dust, aerosol, or splash-generating tasks. Face shield over goggles where significant splash potential exists.
Hand protection	Disposable nitrile gloves suitable for dry-solid handling. Inspect before use; change immediately if contaminated, damaged, or degraded. Consider double gloves for neat powder.
Skin protection	Laboratory coat, long trousers, and closed-toe footwear. Add a chemical-resistant apron or disposable coverall for higher-exposure work.
Respiratory protection	Normally unnecessary inside effective containment. If engineering controls cannot prevent airborne particulate exposure, use a NIOSH-approved particulate respirator under a compliant respiratory-protection program (29 CFR 1910.134).
Hygiene	Wash hands after handling and before breaks. Remove contaminated clothing. Decontaminate work surfaces and equipment.

PPE must be selected by the employer based on task-specific hazard assessment, quantity, physical form, and exposure potential.

09. Physical and chemical properties

Physical state	Solid

Appearance	Lyophilized solid.
Color	White (batch COA sample description: “White lyophilized powder”).
Odor / odor threshold	No reliable substance-specific data available
Melting point / freezing point	No reliable data available
Boiling point / range	Not applicable / decomposes; no reliable data available
Flammability	No reliable data available
Lower / upper explosion limit	No reliable data available
Flash point	Not applicable (solid)
Auto-ignition temperature	No reliable data available
Decomposition temperature	No reliable data available
pH	Not applicable (dry solid)
Kinematic viscosity	Not applicable to solid
Solubility	No product-specific measured solubility data available
Partition coefficient (n-octanol/ water)	No experimental data available
Vapor pressure	Not determined
Evaporation rate	Not applicable (non-volatile solid).
Vapor density	Not determined
Specific gravity / relative density	Not determined
Particle characteristics	No lot-specific particle-size data available
Molecular weight	4813 g/mol
Molecular formula	C225H348N48O68
Stability in solution	Subject to hydrolytic and oxidative degradation typical of peptides. Protect from light and microbial contamination; use a laboratory-established stability period for the prepared solution.

Physicochemical summary: non-volatile solid with negligible vapor pressure; a sharp melting point is typically not observed because the material chars or decomposes on heating. Flash point and pH are not applicable to the dry solid. Solution pH depends on concentration and buffer.

10. Stability and reactivity

Reactivity	No dangerous reaction known under recommended handling and storage conditions.
Chemical stability	Expected to be stable as dry material when stored as directed; peptide may undergo hydrolytic or oxidative degradation.
Possibility of hazardous reactions	Hazardous polymerization is not expected.

Conditions to avoid	Heat, moisture, direct sunlight, UV exposure, dust generation, and prolonged exposure to air.
Incompatible materials	Strong oxidizers, strong acids, and strong bases.
Hazardous decomposition products	Carbon monoxide, carbon dioxide, nitrogen oxides, and other irritating or toxic fumes under fire or thermal decomposition conditions.

11. Toxicological information

Data limitation: The toxicological properties of Tirzepatide have not been fully characterized. Where an endpoint is marked “Not classified”, the available evidence does not meet OSHA/GHS classification criteria; this does not establish absence of hazard.

Likely routes of exposure	Inhalation, eye contact, skin contact, and ingestion.
Acute toxicity	No reliable quantitative oral, dermal, or inhalation LD_{50}/LC_{50} data identified. Not classified based on available data.
Skin corrosion / irritation	No reliable standardized test data identified. Not classified based on available data; mechanical or nonspecific irritation cannot be excluded.
Serious eye damage / irritation	No reliable standardized test data identified. Fine powder may mechanically irritate eyes.
Respiratory / skin sensitization	No reliable substance-specific data identified. Sensitization cannot be excluded.

Tirzepatide is a known GLP-1/GIP receptor agonist; this pharmacological activity is noted to justify treating the substance as bioactive with unknown occupational toxicity, independent of its GHS classification status.

11. Toxicological information · continued

Germ cell mutagenicity	No reliable substance-specific data identified. Not classified based on available data.
Carcinogenicity	Category 2 (H351). A two-year rat study reported thyroid C-cell tumors; relevance to humans is not established. Classification is a conservative active-substance determination based on the cited prescribing information. Not listed in the NTP Report on Carcinogens or the IARC Monographs and not regulated as a carcinogen by OSHA.
Reproductive toxicity	Category 2 (H361). Animal studies reported fetal growth reductions and developmental abnormalities; classification is based on the cited prescribing information.
STOT, single exposure	No reliable substance-specific data identified. Not classified based on available data.
STOT, repeated exposure	No reliable substance-specific data identified. Not classified based on available data.
Aspiration hazard	Not applicable to the supplied solid under normal conditions.
Symptoms related to characteristics	Systemic absorption may cause nausea, vomiting, diarrhea and low blood sugar (prescribing information). Dust may cause mechanical irritation.
Delayed / immediate / chronic effects	Suspected carcinogenic and reproductive effects (see Carcinogenicity and Reproductive toxicity above). Other delayed or chronic effects have not been characterized.
Numerical measures of toxicity	No reliable numerical toxicity values available.
Interactive effects	No information on interactive effects was identified.

Alternative information / method	Health-hazard classifications in Section 2 are derived from published data on the active substance (the regulatory prescribing information cited in Section 16), applied to the substance as supplied (essentially 100% active ingredient; purity per the batch COA) using the criteria of 29 CFR 1910.1200 Appendix A. The supplied material has not been tested as such.
Derived no-effect level (DNEL)	No substance-specific DNEL has been derived.
Predicted no-effect concentration (PNEC)	No substance-specific PNEC has been derived.

12. Ecological information

Ecotoxicity	No reliable substance-specific fish, aquatic invertebrate, or algae toxicity data identified. Avoid environmental release.
Persistence / degradability	No reliable substance-specific biodegradation data identified. Peptide bonds may undergo environmental degradation; rate and products are unknown.
Bioaccumulative potential	No measured BCF or log Kow is available. Multiple ionizable groups and high polarity support low expected passive bioaccumulation; no bioaccumulation classification is assigned.
Mobility in soil	No reliable data available.
Other adverse effects	No reliable data available.

Sections 12 to 15 are included for completeness; OSHA does not enforce their substantive content under Appendix D of 29 CFR 1910.1200.

Peptide bonds are expected to hydrolyze in the environment, but the rate varies.

13. Disposal considerations

Waste treatment

Dispose of material, contaminated PPE, and containers through a licensed waste contractor in accordance with federal, state, and local requirements. Do not discharge to drains, sewers, or waterways. Do not reuse empty containers. The waste generator is responsible for determining whether the waste meets hazardous-waste criteria at the time of disposal.

14. Transport information

Framework	UN number	Proper shipping name	Class	Packing group
U.S. DOT	Not assigned	Not regulated as dangerous goods*	,	
IATA	Not assigned	Not regulated as dangerous goods*	,	
IMDG	Not assigned	Not regulated as dangerous goods*	,	

*Based on current intrinsic-hazard information for the parent substance. The stated transport classification applies to the supplied material; quantity-, packaging-, carrier-, and mode-specific consignment requirements apply at shipment.

Environmental hazards	Not listed as a marine pollutant (49 CFR 172.101 Appendix B; IMDG Code). No aquatic-toxicity data meeting the UN environmentally hazardous substance criteria were identified for the product.

Transport in bulk	Not applicable. The product is supplied in non-bulk packagings and is not transported in bulk under IMO instruments (MARPOL Annex II / IBC Code).
Special precautions	Protect from heat, moisture, light, and physical damage. Maintain required product-label storage conditions.

Transport determination: this solid product does not meet the criteria of a U.S. DOT, IATA or IMDG dangerous-goods class and is not regulated as dangerous goods in the supplied form.

15. Regulatory information

Jurisdiction: this SDS is prepared for supply and use in the United States under the OSHA Hazard Communication Standard (29 CFR 1910.1200). Active ingredient CAS number(s) assessed: 2023788-19-2. U.S. TSCA: no exact CAS match on that public inventory (2023788-19-2); confidential identities are not visible in the public file. California Proposition 65: no exact active-ingredient CAS match on the official list dated July 31, 2026. CERCLA/SARA: no listed component was identified under 40 CFR 302.4 or 40 CFR 372.65 in the reviewed public records; threshold and release-reporting duties remain quantity- and use-dependent. Sources checked: EPA TSCA non-confidential Inventory (July 2026), OEHHA Proposition 65 list (July 31, 2026), 40 CFR 302.4 and 40 CFR 372.65. Public-inventory status is not product approval or authorization.

16. Other information

Document ID	LL-SDS-TIRZEPATIDE-001
REVISION DATE	2026-10-22
VERSION	1.8
Prepared for	Loti Labs
Basis	OSHA Hazard Communication Standard, 29 CFR 1910.1200, including Appendix D; OSHA HCS 2024 alignment (primarily GHS Revision 7). Jurisdiction: United States; Section 14 covers U.S.-origin shipments under 49 CFR, the IATA Dangerous Goods Regulations and the IMDG Code.
Revision history	Revision 1.8 (2026-10-22): final line-by-line consistency review of all sections; Section 3 excipient statement completed and duplicate composition note removed; Section 4 delayed effects aligned with the Section 2 hazard statements; wording, spelling (U.S.), units and batch-method text standardized. Revision 1.7 (2026-10-18): checked against the batch Certificate(s) of Analysis listed below; batch-documentation statements (assay, counter-ion, water and solvent content) corrected to match what the batch COAs actually report; Section 1 other means of identification completed; Section 9 completed for all Appendix D properties (color, flammability limits, vapor density, evaporation rate, particle characteristics); Section 11 interactive-effects and data-basis statements added (Appendix D 11(e), 11(g)); Section 14 environmental-hazard, bulk-transport and special-precaution entries completed; Section 15 limited to U.S. federal and state requirements (non-U.S. inventory statements removed); Section 7 storage reference limited to the product label (the batch COAs do not state storage conditions). Revision 1.6 (2026-10-03): completed manual sheet-by-sheet identity, classification, label-element, toxicology, transport and regulatory review; removed pilot and template-residue language; reconciled Sections 2, 3, 9, 11, 14 and 15.

Batch documentation reviewed	SR Bio Labs COA, lot LOT-TIRZ-00013, dated 2026-01-08: identity by LC-MS (mass 4813.4 Da); purity 99.36% (HPLC); measured content 5.87 mg. Bioviridian COA (verification code COA6766), lot LL-TZ10-726, dated 2026-07-27: identity by LC-MS (mass 4813.5 Da); purity 99.78% (RP-HPLC, 214 nm); measured content 10.73 mg. Bioviridian COA (verification code COA7197), lot LL-TZ30-726, dated 2026-08-01: identity by LC-MS (mass 4813.5 Da); purity 99.86% (RP-HPLC, 214 nm); measured content 31.31 mg. The COA's QR code resolves to an unrelated record (COA8701); the printed verification code COA7197 and its matching laboratory record were used. Bioviridian COA (verification code COA7198), lot LL-TZ50-726, dated 2026-08-01: identity by LC-MS/MS (mass 4813.5 Da); purity 99.86% (RP-HPLC, 214 nm); measured content 49.61 mg. The COA's QR code resolves to an unrelated record (COA8701); the printed verification code COA7198 and its matching laboratory record were used. This SDS is product-level; lot-specific identity, purity and content are governed by the batch Certificate of Analysis.

Principal sources consulted

PubChem. Tirzepatide, Compound Summary, CID 166567236. National Center for Biotechnology Information. https://pubchem.ncbi.nlm.nih.gov/compound/166567236. Accessed 2026-07-15.

OSHA. Hazard Communication Standard, 29 CFR 1910.1200, including Appendix D, Safety Data Sheets. https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1200. Accessed 2026-07-15.

OSHA. Hazard Communication Standard Final Rule (2024). https://www.osha.gov/hazcom/rulemaking. Accessed 2026-07-15.

United Nations. Globally Harmonized System of Classification and Labelling of Chemicals, Revision 7 (2017). https://unece.org/transport/dangerous-goods/ghs-rev7-2017. Accessed 2026-07-15.

NTP. Report on Carcinogens, Fifteenth Edition. https://ntp.niehs.nih.gov/whatwestudy/assessments/cancer/roc. Accessed 2026-07-15.

IARC. Agents Classified by the IARC Monographs. https://monographs.iarc.who.int/agents-classified-by-the-iarc/. Accessed 2026-07-15.

DailyMed/FDA. Tirzepatide prescribing information, Nonclinical Toxicology and Use in Specific Populations, Pregnancy. https://dailymed.nlm.nih.gov/dailymed/search.cfm?query=tirzepatide. Accessed 2026-10-03.

EPA. TSCA Chemical Substance Inventory, non-confidential portion (July 2026 release). https://www.epa.gov/tsca-inventory. Accessed 2026-10-18.

OEHHA. Proposition 65 List of chemicals known to the State of California to cause cancer or reproductive toxicity (list dated July 31, 2026). https://oehha.ca.gov/proposition-65/proposition-65-list. Accessed 2026-10-18.

Key abbreviations

ACGIH, American Conference of Governmental Industrial Hygienists · BCF, Bioconcentration factor · CAS, Chemical Abstracts Service · GHS, Globally Harmonized System · IATA, International Air Transport Association · IMDG, International Maritime Dangerous Goods · NIOSH, National Institute for Occupational Safety and Health · OEL, Occupational exposure limit · OSHA, Occupational Safety and Health Administration · PPE, Personal protective equipment · STOT, Specific target organ toxicity.

16. Other information · disclaimer

The information in this Safety Data Sheet reflects the sources and product records cited as of the revision date and is provided for occupational handling of the product described.

Because substance-specific toxicological, ecotoxicological, and physical-hazard data are limited, this document uses conservative handling guidance and clearly identifies data gaps. Loti Labs does not warrant that the information is exhaustive. Users are responsible for determining suitability for their operation, conducting task-specific risk assessment, maintaining appropriate controls, and complying with all applicable federal, state, and local requirements.

This product is intended solely for scientific research and development. It is not for human or veterinary use and is not intended for food, drug, cosmetic, household, agricultural, clinical, therapeutic, or diagnostic applications.

Document review and approval

By signing below, the reviewer confirms that the supplied form, composition, hazard classification, transport classification and regulatory content of this safety data sheet have been reviewed and are approved for release.

CHECKED BY	Dr Afroza Begum
CREDENTIALS	PhD in Biosciences
DATE	10/11/2026
SIGNATURE	Afroza Begum

Scope of review: Reviewed for content, classification, labelling and transport under 29 CFR 1910.1200 (Appendices A to D) and 49 CFR. Compound identity was checked against public references (PubChem, CAS) and the supplier’s product specification. Batch composition, purity and certificates of analysis were not verified as part of this review. Transport classification reviewed for consistency with 49 CFR; classification for shipment remains the shipper’s responsibility. Applies to version 1.8 dated 2026-10-22 only.

PEPTIDE PURITY. SCIENCE DELIVERED.

This SDS is subject to periodic review and revision when material new hazard information becomes available or applicable regulatory requirements change.

This SDS does not replace institutional risk assessment.

This SDS is not a certification of product safety.