



ARCANE

Arcane Peptides

SAFETY DATA SHEET

GHS / OSHA HazCom 2012 Compliant

CAS: 2381089-83-2

Formula: C221H342N46O68

Document ID: bdd55647

Revision Date: 2026-05-28

Version: 1.0

Section 1 — Product and Company Identification

Product Name	CAS: 2381089-83-2
Synonyms	Triple G; orb1981169; EX-A7826E
CAS Number	Not determined
Molecular Formula	C221H342N46O68
IUPAC Name	20-[[[(1S)-4-[2-[2-[2-[[[(5S)-5-[[[(2S)-6-amino-2-[[[(2S)-2-[[[(2S)-2-[[[(2R)-2-[[[(3S)-2-[[[(2S)-2-[[[(2S)-2-[[[(2S)-2-[[[(2S)-2-[[[(2S)-2-[[[(2S,3R)-2-[[[(2S)-2-[[[(2S,3R)-2-[[[2-[[[(2S)-5-amino-2-[[[2-[[[(2S)-2-amino-3-(4-hydroxyphenyl)propanoyl]amino]-2-methylpropanoyl]amino]-5-oxopentanoyl]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]-2,4-dimethylpentanoyl]amino]-4-methylpentanoyl]amino]-3-carboxypropanoyl]amino]hexanoyl]amino]-6-[[[(2S)-1-[[[(2S)-5-amino-1-[[[1-[[[(2S)-1-[[[(2S)-1-[[[(3S)-1-[[[(2S)-1-[[[(2S)-1-[[[(2S)-1-[[[(2S)-1-[[[(2S)-1-[[[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]-4-carboxy-1-oxobutan-2-yl]amino]-4-methyl-1-oxopentan-2-yl]amino]-4-methyl-1-oxopentan-2-yl]amino]-3-(4-hydroxyphenyl)-1-oxopropan-2-yl]amino]-4-ca...
Identified Uses	Truncated — full value in PDF metadata Research laboratory chemical for in vitro scientific research and development use only.
Restriction on Use	

	Not for human or veterinary use. Not for food, drug, cosmetic, household, agricultural, clinical, therapeutic, or diagnostic applications.
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Manufacturer / Supplier

Company	Arcane Peptides
Address	30 N Gould St, Sheridan, WY 82801, US
Phone	+1-801-306-4955
Website	https://arcanepeptides.com/
Emergency Contact	CHEMTREC
Emergency Phone	800-424-9300 CHEMTREC (USA) 24 Hours/day; 7 Days/week

Section 2 — Hazard Identification

Classification of the substance

Not classified based on currently available data; however, data is limited and hazards cannot be fully characterized. The absence of classification should not be interpreted as a determination of the absence of hazard.

Classification has been conducted in accordance with 29 CFR 1910.1200 (OSHA HazCom 2012) and GHS Rev.8 using all available data and scientifically valid weight-of-evidence approaches (GHS Rev.8 Chapter 1.3.2.4), including read-across from chemical class and structural considerations where substance-specific study data is not available.

Signal Word: **None**

GHS Pictograms:

None required based on classification.

Hazard Statements

None. This substance is not classified for any GHS hazard class based on available data.

Precautionary Statements

- P261: Avoid breathing dust, fume, gas, mist, vapors, or spray.
- P264: Wash hands and exposed skin thoroughly after handling.
- P280: Wear protective gloves, protective clothing, and eye/face protection.
- P501: Dispose of contents and container in accordance with local, regional, national, and international regulations.

Precautionary statements are provided as best practice for handling substances with limited toxicological data, and are not a declaration of GHS classification.

Hazards Not Otherwise Classified (HNOC)

None known based on available data and weight-of-evidence assessment. The toxicological properties of this substance have not been fully characterized; handle as a potentially bioactive substance of unknown toxicity.

Section 3 — Composition / Information on Ingredients

Single-substance product. Chemical identity:

Ingredient	CAS Number	Mol. Formula	Mol. Weight	Concentration

Impurities

No hazardous impurities known to be present above the GHS classification thresholds specified in 29 CFR 1910.1200 Appendix A. Residual synthesis reagents, solvents, and counter-ions may be present at levels consistent with research-grade (>98% purity) material. Balance: non-hazardous impurities. Refer to the accompanying Certificate of Analysis (CoA) for the lot-specific impurity profile.

Section 4 — First Aid Measures

Eye Contact

Rinse cautiously with water for several minutes. If irritation persists, seek medical advice.

Skin Contact

Wash with soap and water. Remove contaminated clothing and wash before reuse. If irritation persists, seek medical advice.

Inhalation

Move affected person to fresh air. If symptoms develop, seek medical advice.

Ingestion

Rinse mouth thoroughly with water. If large amounts are swallowed or if symptoms develop, seek medical advice. Do not induce vomiting unless directed by medical personnel.

Note to Physician

Treat symptomatically. No specific antidote known.

Section 5 — Fire Fighting Measures

Flash Point: *Not determined*

Suitable Extinguishing Media

Use extinguishing media appropriate to the surrounding fire conditions. Carbon dioxide (CO₂), dry chemical powder, foam, or water spray.

Special Hazards

May produce toxic gases upon combustion. Carbon monoxide and other combustion products may be generated.

Protective Equipment for Firefighters

Wear self-contained breathing apparatus (SCBA) and full protective gear. Do not enter fire area without proper protective equipment.

Section 6 — Accidental Release Measures

Personal Precautions

Avoid dust formation. Avoid breathing vapors, mist, or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Use personal protective equipment as described in Section 8.

Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not allow the product to enter drains, sewers, or waterways.

Containment and Cleanup

Sweep up and shovel. Keep in suitable, closed containers for disposal. Avoid raising dust. Clean contaminated surface thoroughly. Dispose of waste in accordance with local regulations (see Section 13).

Section 7 — Handling and Storage

Handling Precautions

Handle as a potentially bioactive substance of unknown toxicity in accordance with OSHA's Laboratory Standard (29 CFR 1910.1450) and the Hazard Communication Standard (29 CFR 1910.1200). Use only in a well-ventilated area, preferably within a chemical fume hood or, when weighing out the dry powder, a balance enclosure or ventilated weighing station, to minimize the generation and inhalation of dusts, aerosols, and mists. Wear appropriate personal protective equipment as specified in Section 8, including chemical-resistant nitrile gloves, a buttoned lab coat, and ANSI Z87.1-compliant safety eyewear; add a NIOSH-approved particulate respirator (e.g., N95 or higher) if engineering controls are insufficient to control airborne particulates. Avoid all contact with skin, eyes, and clothing, and avoid breathing dust, vapor, or aerosol. Because the compound is a high-molecular-weight (4731 g/mol) lyophilized peptide, it is expected to be hygroscopic and electrostatic; minimize exposure to ambient humidity by allowing sealed containers to equilibrate to room temperature in a desiccator before opening, and reseal promptly under an inert atmosphere (e.g., dry nitrogen or argon) where practical. Do not eat, drink, smoke, or apply cosmetics in areas where the substance is handled. Wash hands and exposed skin thoroughly with soap and water after handling and before leaving the work area. Use good industrial hygiene practices and follow the hierarchy of controls described in the OSHA Laboratory Safety Guidance. Decontaminate work surfaces and reusable equipment after use, and manage all waste in accordance with 40 CFR (RCRA) and applicable state and local regulations.

Storage Conditions

Store the lyophilized solid in a tightly closed original container, protected from light, moisture, and air. For peptides of this complexity, consensus guidance from peptide-handling references (e.g., Bachem Peptide Guide) recommends storage of the dry powder at or below -20 degC in a non-frost-free freezer, placed inside a sealed secondary container with a desiccant; reconstituted aqueous or buffered solutions should be aliquoted to avoid repeated freeze-thaw cycles and stored frozen. Keep the container tightly closed and upright in a cool, dry, well-ventilated area, away from direct sunlight, heat, ignition sources, and incompatible materials (see below). Allow vials to warm to ambient temperature in a desiccator before opening to prevent condensation onto the hygroscopic solid. Segregate from foodstuffs and from oxidizers, strong acids, and strong bases in accordance with standard laboratory chemical-segregation practice (e.g., Prudent Practices in the Laboratory, NRC 2011; OSHA 29 CFR 1910.1450). Label all secondary containers in compliance with 29 CFR 1910.1200(f). Specific manufacturer-validated shelf-life data are not provided in the available source information; users should refer to the certificate of analysis or qualify in-house stability before extended storage.

Incompatibilities

Based on general chemistry of polypeptides, avoid contact with strong oxidizing agents (which can oxidize methionine, cysteine, tryptophan, tyrosine, and histidine residues), strong reducing agents (which can cleave disulfide bonds), strong acids and strong bases (which promote hydrolysis of peptide bonds and side-chain degradation, including aspartate/asparagine deamidation and isomerization), proteolytic enzymes, and heavy-metal salts. Avoid moisture, elevated temperatures, prolonged exposure to light, and repeated freeze-thaw cycles, all of which can accelerate chemical and physical degradation. Hazardous decomposition products on heating or combustion may include carbon monoxide, carbon dioxide, nitrogen oxides (NO_x), and other toxic pyrolysis products, consistent with the elemental composition (C₂₂₁H₃₄₂N₄₆O₆₈). Follow the chemical-segregation guidance in OSHA 29 CFR 1910.1450 and Prudent Practices in the Laboratory (NRC, 2011) when co-storing with other laboratory chemicals.

Section 8 — Exposure Controls / Personal Protection

Exposure Limits

No regulatory occupational exposure limits (OEL) have been established by OSHA, ACGIH, NIOSH, or equivalent bodies. No biological exposure indices (BEIs) have been established. Control exposure to the lowest level reasonably achievable (ALARA) using the engineering controls and PPE specified below. Handle as a potentially bioactive substance of unknown toxicity. For research peptides of this class, employers may consult NIOSH guidance on hazardous drugs (NIOSH Publication, current List of Hazardous Drugs in Healthcare Settings) and OSHA's 'Controlling Occupational Exposure to Hazardous Drugs' technical guidance when establishing site-specific control banding.

Engineering Controls

Use in a well-ventilated laboratory area. Weighing, transfer, and reconstitution of the dry solid should be performed inside a containment device such as a ducted fume hood, ventilated balance enclosure/powder weighing hood, or Class II Type A2/B2 biological safety cabinet to minimize inhalation of airborne particulates, in accordance with ANSI/AIHA Z9.5 laboratory ventilation practice and OSHA 29 CFR 1910.1450 (Laboratory Standard). Avoid generation of dusts or aerosols. Provide local exhaust ventilation at points of release. Ensure that an emergency eyewash and safety shower meeting ANSI Z358.1 are accessible in the work area. Restrict access to trained personnel and prohibit eating, drinking, and smoking in areas where the substance is handled, per 29 CFR 1910.141 and 29 CFR 1910.1450.

Personal Protective Equipment

Respiratory Protection: Under normal handling of small quantities within a properly functioning fume hood or ventilated enclosure, additional respiratory protection is not typically required. If engineering controls are inadequate, if airborne dust, mist, or aerosol may be generated, or during bulk weighing/dispensing outside containment, use a NIOSH-approved (42 CFR Part 84) particulate respirator at minimum N95 level; an elastomeric half- or full-face respirator with P100 cartridges, or a powered air-purifying respirator (PAPR) with HEPA filters, is preferred for higher-exposure tasks. Respirator selection, fit testing, medical clearance, and training must follow OSHA's Respiratory Protection Standard, 29 CFR 1910.134.

Hand Protection: Wear chemical-resistant, powder-free protective gloves meeting EN 374 / ASTM D6978 (chemotherapy-drug-tested) where available. Nitrile gloves of ≥ 0.11 mm (4-mil) thickness are recommended for routine handling; double-gloving is recommended when handling the neat solid or concentrated solutions, consistent with USP <800> and NIOSH guidance for handling hazardous drugs. Inspect gloves before use, change immediately if contamination, tearing, or puncture is suspected, and at least hourly during prolonged tasks. Wash hands thoroughly with soap and water after removing gloves, in accordance with 29 CFR 1910.138.

Eye / Face Protection: Wear tightly fitting safety glasses with side shields meeting ANSI/ISEA Z87.1, as required by 29 CFR 1910.133. Indirectly-vented chemical splash goggles are required when handling solutions, when there is potential for splash or aerosol generation, or when working outside a containment hood. A full-face shield worn over goggles is recommended for transfer of bulk powder or during procedures with high splash potential. An ANSI Z358.1-compliant emergency eyewash must be immediately accessible.

Skin Protection: Wear a laboratory coat or, preferably, a disposable, low-linting, liquid-resistant chemotherapy-type gown with closed front, long sleeves, and elastic or knit cuffs (consistent with USP <800> and NIOSH recommendations for handling hazardous drugs). Sleeves should be tucked into gloves. Wear closed-toe, chemical-resistant footwear; disposable shoe covers are recommended when handling the neat solid. Remove and properly dispose of contaminated PPE before leaving the work area; do not reuse disposable garments. Launder reusable protective clothing separately from personal clothing. Skin contact must be prevented; this material should be handled as a potentially bioactive substance of unknown toxicity.

Section 9 — Physical and Chemical Properties

Physical State	Solid (research-grade lyophilised powder or crystalline solid)
Appearance	White to off-white lyophilized powder

Odor	Odorless
Odor Threshold	Not available.
Boiling Point	<i>Not determined</i>
Melting Point	<i>Not determined</i>
Flash Point	<i>Not determined</i>
Auto-ignition Temperature	No data available.
Decomposition Temperature	No experimental data available.
Vapor Pressure	<i>Not determined</i>
Vapor Density	<i>Not determined</i>
Specific Gravity	<i>Not determined</i>
Partition Coefficient (log Kow)	No experimental data available.
Solubility	Soluble in water and DMSO
Stability in Solution	Subject to hydrolytic and oxidative degradation typical of the chemical class; store reconstituted solutions refrigerated or frozen, protect from light, and use within the stability window indicated on the Certificate of Analysis.
pH	<i>Not determined</i>
Molecular Weight	4731 g/mol
Molecular Formula	C221H342N46O68

Section 10 — Stability and Reactivity

Chemical Stability: Stable under normal conditions of use, storage, and transport.

Conditions to Avoid: Excessive heat, open flames, sparks, incompatible materials.

Incompatible Materials: Based on general chemistry of polypeptides, avoid contact with strong oxidizing agents (which can oxidize methionine, cysteine, tryptophan, tyrosine, and histidine residues), strong reducing agents (which can cleave disulfide bonds), strong acids and strong bases (which promote hydrolysis of peptide bonds and side-chain degradation, including aspartate/asparagine deamidation and isomerization), proteolytic enzymes, and heavy-metal salts. Avoid moisture, elevated temperatures, prolonged exposure to light, and repeated freeze-thaw cycles, all of which can accelerate chemical and physical degradation. Hazardous decomposition products on heating or combustion may include carbon monoxide, carbon dioxide, nitrogen oxides (NO_x), and other toxic pyrolysis products, consistent with the elemental composition (C221H342N46O68). Follow the chemical-segregation guidance in OSHA 29 CFR 1910.1450 and Prudent Practices in the Laboratory (NRC, 2011) when co-storing with other laboratory chemicals.

Hazardous Decomposition Products: Upon combustion or decomposition may produce: carbon monoxide (CO), carbon dioxide (CO₂), nitrogen oxides (NO_x).

Hazardous Polymerization: Will not occur.

Section 11 — Toxicological Information

The toxicological properties of this substance have not been fully characterized. Where no authoritative study data was identified, endpoint classifications are based on a weight-of-evidence approach using read-across from the compound's chemical class and structural features, per GHS Rev.8 Chapter 1.3.2.4. "Not classified" entries below mean "not classified based on currently available data" — hazards cannot be excluded.

Acute Toxicity: Acute toxicity data (oral, dermal, inhalation) specific to Triple G (CID 171390338; C221H342N46O68; MW ~4731) have not been located in authoritative sources such as ECHA, NIOSH/CDC, NTP, or peer-reviewed

literature indexed in PubMed. No LD50 or LC50 values from authoritative sources are available for this substance. The toxicological properties of this substance are not fully characterized. Not classified for acute toxicity based on currently available data; hazards cannot be excluded (GHS Rev.8, Chapter 1.3.2.4). As a high-molecular-weight (~4731 Da) substance, systemic absorption following oral or dermal exposure is expected to be limited, but exposure by inhalation of dusts/aerosols or by accidental injection/ingestion should be treated as potentially hazardous and avoided.

Skin Corrosion / Irritation: No experimental skin irritation or corrosion data for Triple G have been identified in ECHA, NTP, or peer-reviewed sources. The toxicological properties of this substance are not fully characterized with respect to skin effects. Not classified for skin corrosion/irritation based on currently available data; hazards cannot be excluded (GHS Rev.8, Chapter 1.3.2.4). Direct contact with skin should be avoided as a precaution.

Serious Eye Damage / Irritation: No experimental eye irritation or serious eye damage data for Triple G have been identified in ECHA, NTP, or peer-reviewed sources. The toxicological properties of this substance are not fully characterized with respect to ocular effects. Not classified for serious eye damage/eye irritation based on currently available data; hazards cannot be excluded (GHS Rev.8, Chapter 1.3.2.4). Eye contact with the solid or solutions should be avoided.

Skin / Respiratory Sensitization: No respiratory or skin sensitization studies (e.g., LLNA, guinea pig maximization, human repeat-insult patch testing) for Triple G have been identified in ECHA, NTP, or peer-reviewed sources. Many high-molecular-weight polypeptide substances are recognized in the published literature (including occupational health reviews indexed by NIOSH and ECHA guidance on protein allergens) as having the potential to act as respiratory and/or dermal sensitizers, and immunogenicity cannot be excluded for a ~4731 Da multi-residue peptide. Not classified for sensitization based on currently available data; hazards cannot be excluded (GHS Rev.8, Chapter 1.3.2.4). Inhalation of dusts/aerosols and skin contact should be avoided.

Germ Cell Mutagenicity / Genotoxicity: Not classified based on currently available data; hazards cannot be excluded. Weight-of-evidence assessment applied using read-across from chemical class and structural considerations (GHS Rev.8 Chapter 1.3.2.4); no authoritative substance-specific study data identified.

Carcinogenicity: Triple G is not listed by IARC, the U.S. National Toxicology Program (NTP) Report on Carcinogens, OSHA (29 CFR 1910 Subpart Z), the U.S. EPA IRIS database, or ACGIH as a known or suspected carcinogen. No long-term carcinogenicity bioassays for this substance have been identified in peer-reviewed literature. The toxicological properties of this substance are not fully characterized with respect to carcinogenic potential. Not classified for carcinogenicity based on currently available data; hazards cannot be excluded (GHS Rev.8, Chapter 1.3.2.4).

Reproductive Toxicity: No reproductive toxicity, developmental toxicity, or fertility studies for Triple G have been identified in ECHA, NTP, EPA, or peer-reviewed sources. The toxicological properties of this substance are not fully characterized with respect to effects on or via lactation, fertility, or development. Not classified for reproductive toxicity based on currently available data; hazards cannot be excluded (GHS Rev.8, Chapter 1.3.2.4). As a precaution, exposure during pregnancy or while breastfeeding should be avoided.

Specific Target Organ Toxicity (STOT): No specific target organ toxicity data following single exposure (STOT-SE) or repeated exposure (STOT-RE) to Triple G have been identified in ECHA, NTP, NIOSH, or peer-reviewed sources, and no occupational exposure limits (OSHA PEL, NIOSH REL, ACGIH TLV) have been established for this substance. The toxicological properties of this substance are not fully characterized with respect to STOT-SE and STOT-RE endpoints. Not classified for STOT-SE or STOT-RE based on currently available data; hazards cannot be excluded (GHS Rev.8, Chapter 1.3.2.4). Repeated or prolonged occupational exposure should be minimized through engineering controls and personal protective equipment as described in Section 8.

Aspiration Hazard: Not classified based on currently available data; hazards cannot be excluded. Weight-of-evidence assessment applied using read-across from chemical class and structural considerations (GHS Rev.8 Chapter 1.3.2.4); no authoritative substance-specific study data identified.

Derived No-Effect Level (DNEL): No data available — no substance-specific DNEL has been derived.

Predicted No-Effect Concentration (PNEC): No data available — no substance-specific PNEC has been derived.

Section 12 — Ecological Information

No authoritative substance-specific ecotoxicity study data was identified. In the absence of experimental data, adverse environmental effects cannot be fully excluded.

Ecotoxicity: No substance-specific experimental aquatic toxicity data (e.g., fish LC50, Daphnia EC50, algal ErC50) have been identified in authoritative sources (ECHA, EPA ECOTOX, PubChem) for this substance. Not classified as hazardous to the aquatic environment based on weight-of-evidence assessment (no authoritative experimental data identified). The substance is a high-molecular-weight (~4731 g/mol) lipidated peptide-like investigational compound expected to have very low environmental release given its restricted use in research and clinical settings. Avoid release to the environment; prevent entry into drains, watercourses, soil, and groundwater.

Persistence and Degradability: No substance-specific experimental biodegradation studies (e.g., OECD 301/310 ready biodegradability tests) have been identified in authoritative sources for this compound. No definitive persistence determination can be made in the absence of such data.

Bioaccumulative Potential: No substance-specific experimentally determined bioconcentration factor (BCF) or measured log Kow value has been identified in authoritative sources for this compound. Given its very high molecular weight (~4731 g/mol), which substantially exceeds the 700 g/mol threshold commonly applied in regulatory bioaccumulation screening (e.g., ECHA REACH Annex XIII guidance), and its multiple ionizable and polar functional groups, significant bioaccumulation in aquatic organisms is not anticipated; however, this conclusion is based on weight-of-evidence and not on substance-specific experimental data.

Mobility in Soil: No substance-specific experimental data identified.

Other Adverse Effects: No other adverse environmental effects identified. The substance is not included on the Montreal Protocol list of ozone-depleting substances.

Section 13 — Disposal Considerations

Dispose of contents and container in accordance with all local, state, and federal regulations. Do not dispose of this material into sewers or waterways. Contact a licensed waste disposal company for disposal guidance.

US: Dispose in accordance with 40 CFR Parts 261-270 (RCRA). **EU:** Dispose according to Directive 2008/98/EC (Waste Framework Directive).

Section 14 — Transport Information

DOT (US)	Not regulated as dangerous goods under DOT (49 CFR) based on current classification.
IATA	Not regulated as dangerous goods under IATA Dangerous Goods Regulations based on current classification.
IMDG	Not regulated as dangerous goods or as a marine pollutant under the IMDG Code based on current classification.
UN Number	Not applicable.

Transport classifications above are based on the substance's intrinsic hazard classification; the shipper must independently verify the classification, packaging, labelling, and documentation requirements for their specific shipment configuration, quantity, and carrier (including airline policies) prior to dispatch.

Section 15 — Regulatory Information

United States

TSCA (Toxic Substances Control Act): May be eligible for exemption from TSCA inventory listing requirements under the R&D provisions of 40 CFR 720.36, depending on actual conditions of use. This substance is supplied solely for use in scientific research and development in small quantities; it is not intended for, and shall not be used for, any commercial manufacturing, processing, or distribution in commerce. The importer/end user is responsible for confirming that the R&D exemption criteria are met for their specific use. **OSHA HazCom 2012:** This SDS was prepared in accordance with 29 CFR 1910.1200 (HazCom 2012), aligned with the Globally Harmonized System (GHS) Rev. 8. **CERCLA / SARA Title III:** Not listed as a CERCLA Hazardous Substance (40 CFR 302.4); not subject to SARA 313 reporting based on available classification data. Users must independently verify applicability for their facility.

European Union

REACH (EC 1907/2006): Supplied solely for Scientific Research and Development (SR&D) use in quantities below 1 tonne per year per legal entity. Where applicable, this use may be exempt from REACH registration obligations under the scientific research and development provisions of REACH Article 3(23) and the conditions of Article 26(3); importers/users should independently verify the applicable exemption pathway for their specific use. If the substance is used as part of a formally notified Product and Process Oriented Research and Development (PPORD) programme, the separate notification procedure under REACH Article 9 (with a 5-year exemption renewable once) may apply instead. **CLP (EC 1272/2008):** Not classified under CLP based on available data; no harmonized classification entry identified in Annex VI of CLP or the ECHA Classification and Labelling (C&L) Inventory.

Canada

WHMIS 2015 / HPR: Not classified as a hazardous product under the Hazardous Products Act and Hazardous Products Regulations (SOR/2015-17) based on available data and weight-of-evidence assessment. Supplied for laboratory research use only. **DSL/NDSL:** Research-use exemption applies; substance is not intended for commercial import or manufacture in Canada.

Note: The regulatory statements above reflect the intended use of this substance for scientific research and development only and do not constitute a legal determination of regulatory status. If the substance is used outside the R&D exemption scope, users are solely responsible for independently verifying applicable regulatory obligations (TSCA, REACH, WHMIS, state, and local) for their specific use and jurisdiction prior to any such use.

Section 16 — Other Information

Document ID	bdd55647-5bd6-4233-8145-d3c5ac533a13
Revision Date	2026-05-28
Version	1.0
Prepared By	Prepared in accordance with GHS Rev.8 and OSHA HazCom 2012 (29 CFR 1910.1200). Independent review by a qualified chemical safety professional is recommended prior to use.

Revision History

Revision date: 2026-05-28

Version: 1.0

Change description: Initial issue. Document prepared in 16-section GHS Rev.8 / OSHA HazCom 2012 format.

Sources Used

- PubChem (U.S. National Library of Medicine / NCBI) — <https://pubchem.ncbi.nlm.nih.gov>
- Peer-reviewed chemistry and toxicology literature (class-based read-across and weight-of-evidence assessment per GHS Rev.8 Chapter 1.3.2.4)
- OSHA HazCom 2012 / 29 CFR 1910.1200 Appendix A–C; GHS Rev.8; OECD Test Guidelines

Key to Abbreviations

CAS = Chemical Abstracts Service; GHS = Globally Harmonized System of Classification and Labelling of Chemicals; OSHA = U.S. Occupational Safety and Health Administration; HazCom = Hazard Communication Standard; REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals; CLP = Classification, Labelling and Packaging Regulation; TSCA = Toxic Substances Control Act; WHMIS = Workplace Hazardous Materials Information System; OEL = Occupational Exposure Limit; PEL = Permissible Exposure Limit; TLV = Threshold Limit Value; REL = Recommended Exposure Limit; STOT = Specific Target Organ Toxicity; LD50 = Median Lethal Dose; LC50 = Median Lethal Concentration; PPE = Personal Protective Equipment; SCBA = Self-Contained Breathing Apparatus; R&D = Research and Development.

Disclaimer

DISCLAIMER: The information in this Safety Data Sheet is compiled from the authoritative sources cited above, supplemented by weight-of-evidence assessment based on the compound's chemical class and published literature. It is believed to be accurate as of the revision date but is provided "as is" without warranty of any kind, express or implied, including fitness for a particular purpose. The preparer of this document has not independently tested the substance described herein. Users bear sole responsibility for verifying all information, ensuring safe handling, and compliance with all applicable federal, state, provincial, and local regulations. This SDS is not a substitute for independent chemical safety assessment by a qualified professional. This product is intended for scientific research and development use only and is not for human consumption, drug, food, cosmetic, agricultural, or household use.

This SDS complies with GHS Revision 8 / UN GHS Rev.8 and OSHA HazCom 2012 (29 CFR 1910.1200).