MOTS-c

CAS: 1627580-64-6
Formula: C101H152N28O22S2

Document ID: 44931be8
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Version: 1.0

Section 1 — Product and Company Identification

Product Name	MOTS-c
Synonyms	Mots-c; 1627580-64-6; UNII-A5CV6JFB78
CAS Number	1627580-64-6
Molecular Formula	C101H152N28O22S2
IUPAC Name	(4S)-4-[[(2S)-5-amino-2-[[(2S)-2-[[(2S)-2-[[(2S)-2-amino-4-methylsulfanylbutanoyl]amino]-5-carbamimidamidopentanoyl]amino]-3-(1H-indol-3-yl)propanoyl]amino]-5-oxopentanoyl]amino]-5-[[(2S)-1-[[2-[[(2S)-1-[[(2S,3S)-1-[[(2S)-1-[[(2S)-1-[(2S)-2-[[(2S)-1-[[(2S)-6-amino-1-[[(2S)-1-[[(1S)-4-carbamimidamido-1-carboxybutyl]amino]-4-methyl-1-oxopentan-2-yl]amino]-1-oxohexan-2-yl]amino]-5-carbamimidamido-1-oxopentan-2-yl]carbamoyl]pyrrolidin-1-yl]-3-(4-hydroxyphenyl)-1-oxopropan-2-yl]amino]-1-oxo-3-phenylpropan-2-yl]amino]-3-methyl-1-oxopentan-2-yl]amino]-3-(4-hydroxyphenyl)-1-oxopropan-2-yl]amino]-2-oxoethyl]amino]-4-methylsulfanyl-1-oxobutan-2-yl]amino]-5-oxopentanoic acid
Identified Uses	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.

Manufacturer / Supplier

Company	Ruo.bio
Address	30 N Gould St, Sheridan, WY 82801, US
Phone	+1-804-636-6879
Website	https://ruo.bio/
Emergency Phone	

	+1(804)636-6879 - Monday-Friday: 9:00 AM - 5:00 PM Pacific

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
MOTS-c	1627580-64-6	C101H152N28O22S2	2174.6 g/mol	>98% (research grade)

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 research peptide of unknown toxicity in accordance with OSHA HazCom 2012 (29 CFR 1910.1200) and general laboratory practices described in OSHA 29 CFR 1910.1450 (Occupational Exposure to Hazardous Chemicals in Laboratories). Use only in a well-ventilated area, preferably within a chemical fume hood or biosafety cabinet when weighing or manipulating the dry lyophilized powder, since fine peptide powders can become airborne and form inhalable dust. Wear appropriate personal protective equipment, including chemically resistant nitrile

gloves, safety goggles meeting ANSI Z87.1, a buttoned lab coat, and, when engineering controls cannot prevent dust generation, a NIOSH-approved particulate respirator (e.g., N95 or higher). Avoid inhalation, ingestion, skin contact, and contact with eyes and mucous membranes. Do not eat, drink, smoke, or apply cosmetics in areas where the material is handled. Minimize generation of dust and aerosols; tare and weigh in closed or semi-closed containment. Ground and bond containers when transferring to prevent static accumulation. Keep containers tightly closed when not in use and reseal immediately after sampling. Wash hands, forearms, and any exposed skin thoroughly with soap and water after handling and before breaks and at the end of the work shift. Decontaminate work surfaces and reusable equipment after use. Lyophilized peptides are typically hygroscopic; allow sealed vials to equilibrate to room temperature before opening to prevent condensation and moisture uptake that can promote hydrolysis. Trifluoroacetate counter-ion may be present (MOTS-c is commonly supplied as the TFA salt); avoid strong heating, which can liberate corrosive/toxic decomposition products (see Section 10). For research and laboratory use only by trained personnel.

Storage Conditions

Store the lyophilized solid in tightly closed, original containers under an inert atmosphere (e.g., argon or nitrogen) where practical, protected from light, moisture, and heat. Long-term storage of the dry peptide is recommended at -20 degC or colder (-80 degC preferred for extended storage), kept desiccated. Keep away from oxidizing agents and incompatible materials (see below). After reconstitution in aqueous or DMSO-based solvent, store aliquots frozen at -20 degC or -80 degC to minimize freeze-thaw cycles; avoid repeated freeze-thaw, which can accelerate aggregation, oxidation of methionine/tryptophan residues, and hydrolytic degradation. Do not store dilute aqueous solutions at ambient temperature for prolonged periods, as peptides containing Met, Trp, Arg, Gln, and Asn are susceptible to oxidation, deamidation, and hydrolysis. Storage area should be cool, dry, well-ventilated, and access-controlled, with secondary containment to capture spillage. Do not store with food, beverages, or feed. Specific shelf-life data have not been established by an authoritative regulatory source; rely on the date and conditions documented by the producer of the specific lot.

Incompatibilities

Avoid contact with strong oxidizing agents (e.g., peroxides, hypochlorites, permanganates, nitric acid, chromates), which can oxidize the methionine and tryptophan residues and degrade the peptide backbone. Avoid strong acids and strong bases, which will catalyze hydrolysis of peptide bonds and side-chain functionalities (amide, guanidino, indole). Avoid strong reducing agents that could disrupt the molecular integrity of sulfur-containing residues. Protect from heat, open flames, ignition sources, and direct sunlight/UV light, which can promote oxidation and photodegradation of aromatic residues. Protect from moisture and humid air, since hydration of the lyophilized solid promotes hydrolysis. Avoid prolonged exposure to atmospheric oxygen by maintaining tightly closed containers, ideally under inert gas. If supplied as the trifluoroacetate (TFA) salt, note that thermal decomposition or contact with strong bases or active metals may release hydrogen fluoride and other corrosive/toxic fluorinated decomposition products (see Section 10). Incompatible container materials include reactive metals; use chemically resistant glass or appropriate polymer vials (e.g., polypropylene).

Section 8 — Exposure Controls / Personal Protection

Exposure Limits

No regulatory occupational exposure limits (OEL) have been established by OSHA, ACGIH, NIOSH, or equivalent bodies for MOTS-c (CAS 1627580-64-6). 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 laboratory use, follow the general requirements of the OSHA Laboratory Standard (29 CFR 1910.1450) and the Chemical Hygiene Plan governing the workplace.

Engineering Controls

Use in a designated laboratory area equipped with mechanical ventilation. Weigh and manipulate dry powder inside a certified chemical fume hood, ventilated balance enclosure, or Class I/II biological safety cabinet operated as a containment device to prevent generation and inhalation of airborne particulates, consistent with NIOSH recommendations for handling potent powders. Where reconstitution or aliquoting of solutions may generate aerosols, perform work in a fume hood or biosafety cabinet. Provide readily accessible eyewash stations and safety showers in the work area in accordance with ANSI/ISEA Z358.1. Maintain good housekeeping; promptly clean spills using HEPA-filtered vacuum or wet wipe methods. Restrict access to trained personnel. Prohibit eating, drinking, smoking, and storage of food in areas where MOTS-c is handled (29 CFR 1910.141 and 1910.1450).

Personal Protective Equipment

Respiratory Protection: Under normal small-scale laboratory use within a properly functioning fume hood or biosafety cabinet, additional respiratory protection is generally not required. If operations occur outside primary containment, or if dust, mist, or aerosol generation is possible (e.g., weighing dry peptide outside a ventilated enclosure, lyophilization, large-scale handling), use a NIOSH-approved (42 CFR Part 84) particulate respirator equipped with N100/P100 filters or a powered air-purifying respirator (PAPR) with HEPA cartridges. All respirator use must be implemented under a written respiratory protection program meeting OSHA 29 CFR 1910.134, including hazard assessment, medical clearance, fit testing, and training.

Hand Protection: Wear chemically resistant, disposable laboratory gloves such as nitrile (recommended minimum 4-8 mil) compliant with EN 374 / ASTM D6319. Use double gloves when handling dry powder or concentrated solutions. Inspect gloves before use; change immediately if contamination, degradation, or puncture is suspected, and at minimum every 2 hours of continuous use. No glove material has been specifically tested for permeation against MOTS-c; breakthrough times are not established. Wash hands thoroughly with soap and water after removing gloves and before leaving the work area, per 29 CFR 1910.138.

Eye / Face Protection: Wear ANSI/ISEA Z87.1-compliant safety glasses with side shields as a minimum. For operations with splash, aerosol, or dry-powder dispersion potential, wear indirectly vented chemical splash goggles. Add a face shield (worn over goggles, not in place of) when handling larger quantities, performing transfers under pressure, or working outside a fume hood. Contact lenses should not be relied upon as protective eyewear. Comply with 29 CFR 1910.133.

Skin Protection: Wear a fully buttoned, long-sleeved laboratory coat or chemical-resistant gown over street clothing, closed-toe shoes covering the entire foot, and full-length trousers. Use disposable sleeve covers and a chemical--resistant apron for tasks with elevated splash or contamination potential. Remove and contain contaminated PPE in the work area; do not wear laboratory clothing into break rooms, offices, or outside the facility. Launder reusable garments separately from personal clothing. Decontaminate or dispose of contaminated PPE as chemical/biological waste in accordance with institutional procedures and 29 CFR 1910.132 / 1910.1450.

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	*Not determined*
Melting Point	*Not determined*
Flash Point	*Not determined*
Auto-ignition Temperature	No data available.
Decomposition Temperature	No experimental data available.

Vapor Pressure	*Not determined*
Vapor Density	*Not determined*
Specific Gravity	*Not determined*
Partition Coefficient (log Kow)	No experimental data available.
Solubility	Soluble in water; soluble in 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	*Not determined*
Molecular Weight	2174.6 g/mol
Molecular Formula	C101H152N28O22S2

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: Avoid contact with strong oxidizing agents (e.g., peroxides, hypochlorites, permanganates, nitric acid, chromates), which can oxidize the methionine and tryptophan residues and degrade the peptide backbone. Avoid strong acids and strong bases, which will catalyze hydrolysis of peptide bonds and side-chain functionalities (amide, guanidino, indole). Avoid strong reducing agents that could disrupt the molecular integrity of sulfur-containing residues. Protect from heat, open flames, ignition sources, and direct sunlight/UV light, which can promote oxidation and photodegradation of aromatic residues. Protect from moisture and humid air, since hydration of the lyophilized solid promotes hydrolysis. Avoid prolonged exposure to atmospheric oxygen by maintaining tightly closed containers, ideally under inert gas. If supplied as the trifluoroacetate (TFA) salt, note that thermal decomposition or contact with strong bases or active metals may release hydrogen fluoride and other corrosive/toxic fluorinated decomposition products (see Section 10). Incompatible container materials include reactive metals; use chemically resistant glass or appropriate polymer vials (e.g., polypropylene).

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

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 for MOTS-c (CAS 1627580-64-6) in humans have not been fully characterized. No quantitative LD50 or LC50 values from authoritative sources (ECHA, NIOSH, NTP, peer-reviewed primary toxicology literature) are available for the oral, dermal, or inhalation routes. The substance has not been assigned acute toxicity classifications under the GHS by OSHA, ECHA, or other competent authorities. In the absence of such data, MOTS-c is not classified for acute toxicity based on currently available data; hazards cannot be excluded, and the material should be handled as a substance of unknown acute toxicity in accordance with 29 CFR 1910.1200 Appendix A.1.3.

Skin Corrosion / Irritation: No experimental skin corrosion or irritation data conforming to OECD Test Guidelines 404/430/431/439 have been identified in authoritative sources (ECHA dossiers, peer-reviewed literature, or PubChem) for MOTS-c (CAS 1627580-64-6). The substance is not classified for skin corrosion/irritation based on currently

available data; hazards cannot be excluded. Direct skin contact with the dry solid or solutions should be avoided as a precaution.

Serious Eye Damage / Irritation: No experimental serious eye damage or eye irritation data conforming to OECD Test Guidelines 405/437/438/491/492 have been identified in authoritative sources (ECHA, peer-reviewed literature, or PubChem) for MOTS-c (CAS 1627580-64-6). The substance is not classified for serious eye damage/eye irritation based on currently available data; hazards cannot be excluded. Mechanical irritation from the solid particulate cannot be ruled out, and eye contact should be avoided.

Skin / Respiratory Sensitization: No data from authoritative sources (ECHA registration dossiers, peer-reviewed literature, OECD TG 406/429/442A-D studies, or human patch-test reports) have been identified regarding respiratory or skin sensitization potential of MOTS-c (CAS 1627580-64-6). The substance is not classified for respiratory or skin sensitization based on currently available data; hazards cannot be excluded. Inhalation of dust/aerosols and dermal contact should be minimized as a precautionary measure.

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: MOTS-c (CAS 1627580-64-6) is not listed as a carcinogen by the U.S. National Toxicology Program (NTP) Report on Carcinogens, the International Agency for Research on Cancer (IARC) Monographs, OSHA (29 CFR 1910.1003 and 1910 Subpart Z), the U.S. EPA IRIS database, or the ACGIH TLV carcinogen notations. No long-term carcinogenicity bioassays have been identified in the peer-reviewed literature. The substance is not classified for carcinogenicity based on currently available data; hazards cannot be excluded.

Reproductive Toxicity: No reproductive or developmental toxicity studies conforming to OECD Test Guidelines 414, 416, 421, 422, or 443 have been identified for MOTS-c (CAS 1627580-64-6) in authoritative sources (ECHA, NTP, EPA, or peer-reviewed primary literature). The substance is not listed by the U.S. EPA, ECHA CLP Annex VI, or California Proposition 65 as a reproductive or developmental toxicant. It is not classified for reproductive toxicity based on currently available data; hazards cannot be excluded.

Specific Target Organ Toxicity (STOT): No specific target organ toxicity has been identified for MOTS-c (CAS 1627580-64-6) in authoritative sources for either single exposure (STOT-SE) or repeated exposure (STOT-RE). No subacute, subchronic, or chronic systemic toxicity studies conforming to OECD Test Guidelines 407, 408, 410, 411, 412, or 413 have been identified in ECHA dossiers or peer-reviewed primary literature. The toxicological properties of this substance are not fully characterized. MOTS-c is not classified for STOT-SE or STOT-RE based on currently available data; hazards cannot be excluded, and repeated or prolonged exposure should be minimized.

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 or terrestrial toxicity data (e.g., fish LC50, Daphnia EC50, algal ErC50) have been identified for MOTS-c (CAS 1627580-64-6) in authoritative sources including ECHA, EPA ECOTOX, PubChem, NIOSH, or peer-reviewed ecotoxicological literature. The substance is a 16-residue mitochondrial-derived peptide used exclusively in laboratory research at small scale; broad environmental exposure is not anticipated under intended use. Not classified as hazardous to the aquatic environment (acute or chronic) based

on a weight-of-evidence assessment, as no authoritative experimental data are available to support a GHS aquatic hazard category. Prevent release to surface waters, drains, soil, and groundwater.

Persistence and Degradability: No substance-specific experimental biodegradation studies (e.g., OECD 301 series ready biodegradability tests) or abiotic degradation half-life data have been identified in ECHA, EPA, or peer-reviewed sources for MOTS-c (CAS 1627580-64-6). Environmental persistence and degradation behavior have not been experimentally characterized and cannot be reliably estimated without substance-specific data.

Bioaccumulative Potential: No substance-specific experimental bioconcentration factor (BCF), bioaccumulation factor (BAF), or measured log Kow (n-octanol/water partition coefficient) data have been identified for MOTS-c (CAS 1627580-64-6) in ECHA, EPA, or PubChem. Given its high molecular weight (2174.6 g/mol), highly polar/ionizable character, and multiple hydrogen-bond donors and acceptors, significant bioaccumulation in aquatic organisms is not anticipated; however, this qualitative assessment has not been confirmed by authoritative experimental measurement.

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	44931be8-4137-4675-ac5e-a78e9479ac37
Revision Date	2026-08-07
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: 2026-08-07
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).