



ARCANE

Arcane Peptides

SAFETY DATA SHEET

GHS / OSHA HazCom 2012 Compliant

NAD⁺

CAS: 159929-29-0

Formula: C₂₁H₂₇N₇O₁₄P₂

Document ID: 0458565e

Revision Date: 2026-05-28

Version: 1.0

Section 1 — Product and Company Identification

Product Name	NAD ⁺
Synonyms	nadide; 53-84-9; coenzyme I
CAS Number	159929-29-0
Molecular Formula	C ₂₁ H ₂₇ N ₇ O ₁₄ P ₂
IUPAC Name	[[[(2R,3S,4R,5R)-5-(6-aminopurin-9-yl)-3,4-dihydroxyoxolan-2-yl]methoxy-hydroxyphosphoryl] [(2R,3S,4R,5R)-5-(3-carbamoylpyridin-1-ium-1-yl)-3,4-dihydroxyoxolan-2-yl]methyl phosphate
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	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

Classified under GHS Rev.8 / OSHA HazCom 2012 — see hazard statements below.

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: *Not determined*

GHS Pictograms:

None required based on classification.

Hazard Statements

- Not Classified
- Reported as not meeting GHS hazard criteria by 114 of 115 companies (only 0.9% companies provided GHS information). For more detailed information, please visit ECHA C&L website.

Precautionary Statements

Refer to standard laboratory handling precautions for unclassified research chemicals. Follow the PPE and engineering controls specified in Section 8.

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
NAD+	159929-29-0	C21H27N7O14P2	663.4 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 in accordance with good industrial hygiene and laboratory safety practice (29 CFR 1910.1450, OSHA HazCom 2012). Because the toxicological profile of this substance has not been fully characterized, treat it as a potentially bioactive compound of unknown toxicity and minimize all routes of exposure. Use only in a well-ventilated area, preferably within a chemical fume hood, certified biological safety cabinet, or local exhaust ventilation when weighing, transferring, or otherwise manipulating the dry powder, to control airborne dust per the OSHA general industry standard for Particulates Not Otherwise Regulated (29 CFR 1910.1000 Table Z-1, 15 mg/m³ total / 5 mg/m³ respirable, used as a precautionary surrogate in the absence of a substance-specific OEL). Wear personal protective equipment as specified in Section 8, including chemical-resistant nitrile gloves, safety eyewear meeting ANSI Z87.1, and a laboratory coat. Avoid generation and inhalation of dust, mist, or aerosols; do not taste, swallow, or allow contact with skin, eyes, or clothing. Do not eat, drink, smoke, or apply cosmetics in areas where the substance is handled or stored. Wash hands and exposed skin thoroughly with soap and water after handling and before breaks. Use grounded equipment when transferring larger quantities of the dry powder to mitigate static accumulation, and avoid heat, sparks, open flame, and other ignition sources as the substance can support combustion if heated to decomposition. Reseal containers promptly after use under a dry, inert atmosphere (nitrogen or argon) where feasible, since the material is hygroscopic and moisture promotes hydrolytic degradation of the pyrophosphate linkage. Keep containers closed and protected from light. Empty containers may retain residue and should be handled as contaminated waste in accordance with Section 13.

Storage Conditions

Store the closed container in a cool, dry, well-ventilated area away from direct sunlight, heat, and ignition sources. The substance is hygroscopic and sensitive to moisture, heat, and light; storage of the lyophilized solid at ≤ -20 degC (with some references recommending -80 degC for long-term storage) in a tightly sealed, light-protected container with desiccant, ideally under an inert atmosphere of nitrogen or argon, is consistent with published guidance for preserving integrity of the dinucleotide (PubChem CID 5893; openwetware/Lidstrom solution-stock compendium). Allow sealed containers to equilibrate to room temperature before opening to prevent condensation of atmospheric moisture onto the solid. Aqueous solutions are subject to hydrolytic and oxidative degradation and should be prepared fresh, kept cold, used promptly, and not returned to the original bulk container. Avoid repeated freeze-thaw cycles by preparing single-use aliquots. Store separately from incompatible materials (see below), foodstuffs, and animal feed. Storage area should be equipped with adequate ventilation, spill containment, and access restricted to authorized personnel. The substance is not classified as a DOT/IATA/IMDG hazardous material for transport, but storage areas should still comply with general OSHA chemical storage requirements (29 CFR 1910.1450, 29 CFR 1910.106 where applicable). No manufacturer-independent shelf-life value has been established by an authoritative regulatory body; observe the expiration date provided on the container label.

Incompatibilities

Keep away from strong oxidizing agents (e.g., peroxides, perchlorates, concentrated nitric acid, chromates, permanganates, hypochlorites), which can react with the reducing nicotinamide ribose moiety and cause exothermic decomposition. Avoid strong acids and strong bases, as well as elevated temperatures and humidity, all of which catalyze hydrolysis of the pyrophosphate and N-glycosidic bonds. The compound is incompatible with strong reducing agents that can convert it to the reduced (NADH) form and with electrophilic alkylating agents that may modify the adenine or nicotinamide ring nitrogens. Protect from direct sunlight and UV radiation. Hazardous decomposition products, as expected from the elemental composition (C, H, N, O, P), include carbon monoxide and carbon dioxide, nitrogen oxides (NO_x), and phosphorus oxides (PO_x); ammonia and other nitrogen-containing fragments may also be liberated upon thermal decomposition. Avoid contact with materials that are reactive toward phosphate esters or primary amides. No specific hazardous polymerization is known to occur.

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 NAD⁺ (CAS 53-84-9 / 159929-29-0). 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.

Engineering Controls

Use in a well-ventilated area. Where dust or aerosols may be generated during weighing, transfer, or reconstitution of the solid, perform operations inside a chemical fume hood, ventilated balance enclosure, or Class I/II biosafety cabinet to minimize inhalation exposure, consistent with the general principles in OSHA 29 CFR 1910.1450 (Laboratory Standard) and the ANSI/AIHA Z9.5 laboratory ventilation guidance. Provide local exhaust ventilation sufficient to keep airborne concentrations as low as reasonably achievable (ALARA). Emergency eyewash and safety shower meeting ANSI Z358.1 must be accessible within the work area. Prohibit eating, drinking, smoking, and cosmetic application in areas where this material is handled, and provide hand-washing facilities at the exit of the work area.

Personal Protective Equipment

Respiratory Protection: Respiratory protection is not normally required when material is handled within a properly functioning fume hood or biosafety cabinet. If engineering controls are not feasible and airborne dust or aerosol may be generated, wear a NIOSH-approved (42 CFR Part 84) air-purifying respirator equipped with N95 or higher-efficiency

particulate filters. For higher exposure potential or unknown airborne concentrations, use a NIOSH-approved P100 filtering facepiece or a powered air-purifying respirator (PAPR) with HEPA filters. All respirator use must comply with a written respiratory protection program under OSHA 29 CFR 1910.134, including fit-testing, medical clearance, and training.

Hand Protection: Wear chemically resistant, disposable laboratory gloves that meet EN 374 / ASTM D6978 standards. Nitrile gloves (minimum thickness 0.11 mm) are generally suitable for incidental contact with the solid or aqueous solutions. Inspect gloves before use, replace immediately if contamination, degradation, or puncture is observed, and follow the double-gloving practice recommended by ASTM D6978 when handling bioactive research compounds of unknown toxicity. Wash hands thoroughly with soap and water after glove removal and before leaving the work area.

Eye / Face Protection: Wear tightly fitting safety goggles meeting ANSI/ISEA Z87.1 (or EN 166 in the EU) when handling the solid or solutions. A face shield worn over safety goggles is recommended where splash, spray, or aerosol generation is possible (e.g., during sonication, vortexing, or dispensing of larger volumes). Contact lenses should not be worn unless used in combination with full protective eyewear. An ANSI Z358.1-compliant emergency eyewash station must be immediately available.

Skin Protection: Wear a buttoned, long-sleeved laboratory coat (flame-resistant where adjacent operations require it) over street clothing that fully covers the legs, plus closed-toe, non-absorbent footwear, in accordance with OSHA 29 CFR 1910.132 and 1910.1450. Use chemically resistant sleeve covers or a disposable laboratory apron/gown when handling larger quantities, weighing the solid, or preparing concentrated solutions. Remove and decontaminate or dispose of contaminated clothing promptly; do not take potentially contaminated PPE outside the designated work area or laundry it with household clothing.

Section 9 — Physical and Chemical Properties

Physical State	Solid (research-grade lyophilised powder or crystalline solid)
Appearance	White to off-white hygroscopic powder
Odor	Odorless
Odor Threshold	Not available.
Boiling Point	<i>Not determined</i>
Melting Point	140.0 - 142.0 °C
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; practically insoluble in ethanol and most organic solvents
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	2.0-3.5 (50 mg/mL in water)
Molecular Weight	663.4 g/mol
Molecular Formula	C21H27N7O14P2

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: Keep away from strong oxidizing agents (e.g., peroxides, perchlorates, concentrated nitric acid, chromates, permanganates, hypochlorites), which can react with the reducing nicotinamide ribose moiety and cause exothermic decomposition. Avoid strong acids and strong bases, as well as elevated temperatures and humidity, all of which catalyze hydrolysis of the pyrophosphate and N-glycosidic bonds. The compound is incompatible with strong reducing agents that can convert it to the reduced (NADH) form and with electrophilic alkylating agents that may modify the adenine or nicotinamide ring nitrogens. Protect from direct sunlight and UV radiation. Hazardous decomposition products, as expected from the elemental composition (C, H, N, O, P), include carbon monoxide and carbon dioxide, nitrogen oxides (NO_x), and phosphorus oxides (PO_x); ammonia and other nitrogen-containing fragments may also be liberated upon thermal decomposition. Avoid contact with materials that are reactive toward phosphate esters or primary amides. No specific hazardous polymerization is known to occur.

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

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: No reliable acute toxicity data (oral, dermal, or inhalation LD₅₀/LC₅₀) for NAD⁺ (CAS 53-84-9) are reported in authoritative regulatory databases (ECHA, NIOSH RTECS, EPA, or PubChem Hazards Identification). The toxicological properties of this substance have not been fully characterized. Not classified for acute toxicity based on currently available data; however, hazards cannot be excluded (per GHS Rev.8, S1.3.2.4). As a fine crystalline powder, handle to minimize generation of dust and avoid ingestion, inhalation, and contact with skin or eyes.

Skin Corrosion / Irritation: No experimental skin corrosion/irritation studies for NAD⁺ are reported in ECHA, PubChem, or peer-reviewed literature retrieved for this substance. Not classified for skin corrosion or irritation based on currently available data; hazards cannot be excluded (GHS Rev.8, S1.3.2.4). The substance is a hygroscopic, acidic solid (containing two phosphate groups) and mechanical/chemical irritation upon prolonged contact with moist skin cannot be ruled out.

Serious Eye Damage / Irritation: No experimental serious eye damage/eye irritation studies for NAD⁺ are available in authoritative sources (ECHA, PubChem). Not classified for eye irritation or serious eye damage based on currently available data; hazards cannot be excluded (GHS Rev.8, S1.3.2.4). Particulate matter contacting the eye may cause mechanical irritation; use appropriate eye protection during handling.

Skin / Respiratory Sensitization: No data from authoritative sources (ECHA registration dossiers, peer-reviewed guideline studies such as OECD 406/429/442) are available regarding respiratory or skin sensitization potential of NAD⁺. Not classified for sensitization based on currently available data; hazards cannot be excluded (GHS Rev.8, S1.3.2.4).

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: NAD⁺ (CAS 53-84-9 / 159929-29-0) is not listed as a carcinogen by IARC, the U.S. National Toxicology Program (NTP) Report on Carcinogens, OSHA (29 CFR 1910 Subpart Z), ACGIH, or the U.S. EPA IRIS

program. No authoritative long-term carcinogenicity bioassay has been identified. Not classified for carcinogenicity based on currently available data; hazards cannot be excluded (GHS Rev.8, S1.3.2.4).

Reproductive Toxicity: No authoritative reproductive toxicity, developmental toxicity, or effects-on-or-via-lactation studies (e.g., OECD 414, 416, 421, 422) for NAD⁺ have been identified in ECHA, NTP, or peer-reviewed regulatory literature. Not classified for reproductive toxicity based on currently available data; hazards cannot be excluded (GHS Rev.8, S1.3.2.4).

Specific Target Organ Toxicity (STOT): No specific target organ toxicity has been identified for NAD⁺ following single exposure (STOT-SE) or repeated exposure (STOT-RE) in authoritative sources (ECHA, NIOSH, EPA, peer-reviewed guideline studies). No occupational exposure limits (OSHA PEL, NIOSH REL, ACGIH TLV) have been established for this substance. Not classified for STOT-SE or STOT-RE based on currently available data; hazards cannot be excluded (GHS Rev.8, S1.3.2.4). The toxicological profile is not fully characterized; handle in accordance with general good industrial hygiene practice.

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 from authoritative sources (ECHA, EPA, NIOSH, peer-reviewed literature) for NAD⁺ (CAS 53-84-9 / 159929-29-0). The substance is not listed on the EPA Toxics Release Inventory and has no harmonized CLP environmental hazard classification in the ECHA C&L Inventory. Not classified as hazardous to the aquatic environment based on weight-of-evidence assessment (no authoritative experimental data identified). NAD⁺ is an endogenous pyridine dinucleotide coenzyme present in all living cells and central to cellular redox metabolism; nonetheless, releases to the environment should be minimized as a matter of good practice.

Persistence and Degradability: No substance-specific experimental biodegradation studies (e.g., OECD 301 series ready biodegradability tests) have been identified from authoritative sources for NAD⁺. The molecule is a highly polar, water-soluble, ionic dinucleotide containing hydrolyzable phosphoanhydride and N-glycosidic bonds; in biological and environmental matrices it is known to be enzymatically and chemically labile, but quantitative environmental half-lives in surface water, soil, or sediment have not been established in authoritative databases.

Bioaccumulative Potential: No experimental bioconcentration factor (BCF) or bioaccumulation factor (BAF) values have been identified from authoritative sources for NAD⁺. Given the high molecular weight (663.4 g/mol), multiple ionizable phosphate groups, permanent positive charge on the nicotinamide ring, high water solubility, and very low predicted log K_{ow} expected for a zwitterionic/charged dinucleotide, significant bioaccumulation in aquatic organisms is not anticipated; however, this assessment is based on physicochemical considerations rather than measured BCF 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

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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.

