glutathione

CAS: 70-18-8
Formula: C10H17N3O6S

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Section 1 — Product and Company Identification

Product Name	glutathione
Synonyms	glutathione; 70-18-8; L-Glutathione reduced
CAS Number	70-18-8
Molecular Formula	C10H17N3O6S
IUPAC Name	(2S)-2-amino-5-[[(2R)-1-(carboxymethylamino)-1-oxo-3-sulfanylpropan-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	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: **WARNING**

GHS Pictograms:

GHS08

Hazard Statements

- H341: Suspected of causing genetic defects [Warning Germ cell mutagenicity]

Precautionary Statements

- P203
- P280
- P318
- P405
- P501

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
glutathione	70-18-8	C10H17N3O6S	307.33 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 safety practice and treat as a potentially bioactive compound of unknown toxicity. Use only in a well-ventilated area, preferably within a chemical fume hood or local exhaust ventilation, to minimize the generation and inhalation of dust. Avoid formation of airborne dust and aerosols; the fine powder can present a nuisance-dust inhalation hazard and a potential combustible-dust hazard. Wear appropriate personal protective equipment as described in Section 8, including chemical-resistant gloves, protective eyewear (safety glasses or goggles), and a laboratory coat; use a NIOSH-approved particulate respirator if engineering controls are insufficient to control airborne exposure. Avoid contact with skin, eyes, and clothing, and avoid breathing dust. Glutathione contains a free sulfhydryl (thiol) group that is readily oxidized in air, especially in moist conditions or in solution; keep containers tightly closed and minimize exposure to air, moisture, and light during weighing and transfer. Prepare solutions immediately before use where possible. Do not eat, drink, or smoke when handling the substance. Wash hands and exposed skin thoroughly after handling. Remove and wash contaminated clothing before reuse. Ground and bond containers when transferring to mitigate static accumulation if handling large quantities of dry powder.

Storage Conditions
Store in the original tightly closed container in a cool, dry, well-ventilated area, protected from light, moisture, air, and sources of heat or ignition. Refrigerated storage (typically 2-8 degC) is recommended to preserve integrity of the free thiol; for long-term storage, lower temperatures (e.g., -20 degC) may be appropriate per the manufacturer's

recommendation on the product label. Because reduced glutathione (GSH) is sensitive to oxidation, storage under an inert atmosphere (nitrogen or argon) and the use of a desiccant is advisable once the container has been opened. Keep away from incompatible materials (see below). Solutions are less stable than the solid and should not be stored for extended periods. Follow any specific storage temperature and shelf-life recommendations provided on the container label; do not use after the assigned expiration or retest date.

Incompatibilities

Strong oxidizing agents (e.g., peroxides, hypochlorites, permanganates, nitric acid, chromates) - the free sulfhydryl (-SH) group of reduced glutathione is readily oxidized, forming the disulfide (GSSG) and potentially hazardous reaction products. Strong acids and strong bases - may cause decomposition of the peptide and loss of integrity. Heavy metal ions (e.g., Hg, Cu, Pb, Cd, Ag) - the thiol group forms stable complexes/mercaptides with soft metal cations. Electrophilic and alkylating agents (e.g., maleimides, iodoacetamide, alpha,beta-unsaturated carbonyl compounds) - react readily with the thiol. Aldehydes and isothiocyanates may also react with the free amine and thiol groups. Avoid exposure to air, moisture, light, and elevated temperatures, which accelerate oxidation and decomposition. Hazardous decomposition products on heating or combustion may include carbon oxides (CO, CO2), nitrogen oxides (NOx), and sulfur oxides (SOx).

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.

Engineering Controls

Use in a well-ventilated area. Where dust or aerosols may be generated during weighing, transfer, or compounding of the solid, perform operations inside a chemical fume hood, ventilated balance enclosure, or local exhaust ventilation (LEV) designed in accordance with ANSI/AIHA Z9.5 and ACGIH 'Industrial Ventilation: A Manual of Recommended Practice.' Provide accessible emergency eyewash and safety shower meeting ANSI Z358.1 within the work area. General mechanical ventilation should be sufficient for handling small quantities of solutions in closed systems. Implement administrative controls including written handling procedures, restricted access, and decontamination of work surfaces after use.

Personal Protective Equipment

Respiratory Protection: Respiratory protection is not normally required when engineering controls (fume hood or LEV) are adequate to prevent airborne exposure. If dust, mists, or aerosols may be generated outside containment, use a NIOSH-approved (42 CFR Part 84) air-purifying respirator equipped with N95 or P100 particulate filters as a minimum. For higher exposure potential or unknown airborne concentrations, use a powered air-purifying respirator (PAPR) or supplied-air respirator. Respirator selection, fit-testing, and use must comply with OSHA 29 CFR 1910.134.
Hand Protection: Wear chemical-resistant protective gloves conforming to EN 374 / ANSI-ISEA 105. Nitrile rubber gloves (recommended minimum thickness >=0.11 mm) are generally suitable for handling the solid and aqueous solutions. Inspect gloves before use; replace immediately if torn, punctured, or contaminated. Follow proper glove removal technique to avoid skin contact, and wash hands thoroughly with soap and water after removing gloves. Breakthrough times have not been established for this specific compound; verify suitability with the glove manufacturer for the exact use scenario.
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 goggles is recommended where splashing, spraying, or dust

generation is foreseeable. Contact lenses should not be worn unless additional eye protection is used. An emergency eyewash station meeting ANSI Z358.1 must be readily accessible in the work area.

Skin Protection: Wear a laboratory coat or chemical-resistant long-sleeved garment, full-length trousers, and closed-toe chemical-resistant footwear. Use a chemical-resistant apron and/or impervious sleeves where splash potential exists. Remove and launder contaminated clothing before reuse; do not take contaminated clothing home. Wash exposed skin promptly with soap and water after handling and before eating, drinking, smoking, or using the restroom. Do not eat, drink, or store food in areas where this material is handled.

Section 9 — Physical and Chemical Properties

Physical State	Solid (research-grade lyophilised powder or crystalline solid)
Appearance	White crystalline powder
Odor	Odorless
Odor Threshold	Not available.
Boiling Point	*Not determined*
Melting Point	195 °C 195 °C
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	Freely soluble in water; soluble in dilute alcohol, liquid ammonia, and dimethylformamide; practically insoluble in ethanol, ether, and acetone
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	2.5-3.5 (1% aqueous solution)
Molecular Weight	307.33 g/mol
Molecular Formula	C10H17N3O6S

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: Strong oxidizing agents (e.g., peroxides, hypochlorites, permanganates, nitric acid, chromates) - the free sulfhydryl (-SH) group of reduced glutathione is readily oxidized, forming the disulfide (GSSG) and potentially hazardous reaction products. Strong acids and strong bases - may cause decomposition of the peptide and loss of integrity. Heavy metal ions (e.g., Hg, Cu, Pb, Cd, Ag) - the thiol group forms stable complexes/mercaptides with soft metal cations. Electrophilic and alkylating agents (e.g., maleimides, iodoacetamide, alpha,beta-unsaturated carbonyl compounds) - react readily with the thiol. Aldehydes and isothiocyanates may also react with the free amine and thiol groups. Avoid exposure to air, moisture, light, and elevated temperatures, which accelerate oxidation and

decomposition. Hazardous decomposition products on heating or combustion may include carbon oxides (CO, CO2), nitrogen oxides (NOx), and sulfur oxides (SOx).

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: 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.

Skin Corrosion / Irritation: 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.

Serious Eye Damage / Irritation: 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.

Skin / Respiratory Sensitization: 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.

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: No indication of carcinogenicity to humans (not listed by IARC).

Reproductive Toxicity: 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.

Specific Target Organ Toxicity (STOT): 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.

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) for glutathione (CAS 70-18-8) were identified in authoritative regulatory databases (ECHA, EPA ECOTOX, PubChem) at the time of preparation. Not classified as hazardous to the aquatic environment (acute or chronic) under GHS/CLP

based on a weight-of-evidence assessment in the absence of authoritative experimental data. Glutathione is an endogenous low-molecular-weight thiol found in virtually all aerobic organisms and functions as an intracellular antioxidant; release of large quantities to surface waters should nonetheless be avoided as a matter of good environmental practice.

Persistence and Degradability: No substance-specific experimental biodegradation data (e.g., OECD 301-series ready biodegradability studies) for glutathione were identified in authoritative regulatory sources. The molecule contains hydrolytically labile peptide (amide) bonds and a free thiol group that is readily oxidized in air and aqueous media to the disulfide form (GSSG); however, in the absence of standardized test data a definitive persistence classification cannot be assigned.

Bioaccumulative Potential: No experimentally determined bioconcentration factor (BCF) for glutathione was identified in authoritative regulatory databases. Glutathione is a highly polar, water-soluble zwitterionic tripeptide with a reported low octanol/water partition coefficient (logP approximately -6.4; peer-reviewed literature, Front. Pharmacol. / MDPI Pharmaceutics reviews), which is well below the ECHA REACH Annex XIII bioaccumulation criterion (log Kow >= 4.5). Significant bioaccumulation in aquatic organisms is therefore not expected, although no substance-specific BCF measurement has been confirmed.

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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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).