Safety Data Sheet SILVER NITRATE

SDS no. 0YS63UL0 • Version 1.0 • Date of issue: 2025-11-17

SECTION 1: Identification

GHS Product identifier

Product name	SILVER NITRATE

Other means of identification

Product	Product Code
Silver Nitrate AR	SR087
Silver Nitrate LR	SL087
Silver Nitrate AR	SA087

Recommended use of the chemical and restrictions on use

Photographic film, catalyst for ethylene oxide, indelible inks, silver plating, silvering mirrors, silver salts, germicide (as a wall spray), hair dyeing, analytical chemistry, antiseptic, purification of drinking water, fused form to cauterize wounds and laboratory reagent.

Supplier's details

Name	ChemSupply Australia Pty Ltd
Address	38-50 Bedford Street 5013 Gillman South Australia Australia
Telephone	08 8440 2000
email	www.chemsupply.com.au

Emergency phone number

CHEMCALL 1800 127 406 (Australia) / +64-4-917-9888 (International)

SECTION 2: Hazard identification

General hazard statement

Classified as dangerous goods according to the Australian Dangerous Goods Code (ADG).

Classified as Hazardous according to the Globally Harmonised System of classification and labelling of Chemicals (GHS) including Work, Health and Safety regulations, Australia.

Classification of the substance or mixture

GHS classification in accordance with: UN GHS revision 7

- Hazardous to the aquatic environment, short-term (acute), Cat. 1
- Hazardous to the aquatic environment, long-term (chronic), Cat. 1
- Oxidizing solids, Cat. 2
- Skin corrosion/irritation, Cat. 1B
- Serious eye damage/eye irritation, Cat. 1

GHS label elements, including precautionary statements

Pictograms

Signal word	**Danger**

Hazard statement(s)

H272	May intensify fire; oxidizer
H314	Causes severe skin burns and eye damage
H410	Very toxic to aquatic life with long lasting effects

Precautionary statement(s)

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P220	Keep away from clothing and other combustible materials.
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor/physcian
P363	Wash contaminated clothing before reuse.
P370+P378	In case of fire: Use agents recommended in Section 5 of SDS for extinction
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/container to an approved waste disposal facility

SECTION 3: Composition/information on ingredients

Mixtures

Molecular weight	169.87

Component	Identification	Weight %	Classifications
Silver nitrate	CAS no.: 7761-88-8 EC no.: 231-853-9 Index no.: 047-001-00-2	<= 100 %	CLASSIFICATIONS: Oxidizing solids, Cat. 2; Skin corrosion/irritation, Cat. 1B; Hazardous to the aquatic environment, short-term (acute), Cat. 1; Hazardous to the aquatic environment, long-term (chronic), Cat. 1. HAZARDS: H272 - May intensify fire; oxidizer; H314 - Causes severe skin burns and eye damage; H400 - Very toxic to aquatic life; H410 - Very toxic to aquatic life with long lasting effects.

SECTION 4: First-aid measures

Description of necessary first-aid measures

General advice	For advice, contact a Poisons Information Centre (e.g. phone Australia 13 11 26; New Zealand 0800 764 766) or a doctor (at once).
If inhaled	If inhaled, remove from contaminated area to fresh air immediately. Apply artificial respiration if not breathing. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.
In case of skin contact	Rinse with plenty of water. Get medical attention if irritation develops and persists.
In case of eye contact	Rinse thoroughly with plenty of water for at least 15 minutes. Get medical attention
If swallowed	Rinse mouth thoroughly with water immediately, repeat until all traces of product have been removed. DO NOT INDUCE VOMITING. Seek medical advice immediately.

Most important symptoms/effects, acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

Indication of immediate medical attention and special treatment needed, if necessary
For advice, contact the National Poisons Information Centre (Phone Australia 13 11 26; New Zealand 0800 764 766) or a doctor.

SECTION 5: Fire-fighting measures

Suitable extinguishing media
Small fire: Use dry chemical, CO2, water spray or foam.
Large fire: Use water spray, fog or foam.
If safe to do so, move undamaged containers from the fire area. Cool containers with flooding quantities of water until well after the fire is out.

Specific hazards arising from the chemical
Hazards from Combustion Products: May liberate toxic fumes in fire such as oxygen, toxic fumes, nitrous gases, toxic oxides of nitrogen, silver/silver oxides.

Fire may produce irritating, poisonous, and/or corrosive gases.

Special protective actions for fire-fighters
Wear SCBA and chemical splash suit with full breathing apparatus. Structural firefighter's uniform will provide limited protection.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

Methods and materials for containment and cleaning up
Sweep up spillage and collect in suitable container for disposal. Avoid dust formation. Keep in suitable, closed containers for disposal.

Other Information: Most organisations using silver compounds collect all silver residues for subsequent recovery.
Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it. If substance has entered a water course or sewer, inform the responsible authority.

SECTION 7: Handling and storage

Precautions for safe handling
Use with adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Discard contaminated shoes.

Conditions for safe storage, including any incompatibilities
Keep container tightly closed when not in use, in a cool, dry, well-ventilated area away from incompatible substances. Keep well closed and protected from light and moisture. Sensitive to light.

SECTION 8: Exposure controls/personal protection

Appropriate engineering controls
Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, gas, etc.) below recommended exposure limits.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection
The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards AS 1337 and be selected and used in accordance with AS 1336.

Skin protection
Clean impervious clothing should be worn. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Body protection
Footwear: Safety boots in industrial situations is advisory, foot protection should comply with AS 2210, Occupational protective footwear - Guide to selection, care and use.

Body Protection: Clean clothing or protective clothing should be worn, preferably with and apron. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Respiratory protection
If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable vapor/ mist filter should be used. Refer to relevant regulations for further information concerning respiratory protective requirements. Reference should be made to Australian Standards AS/ NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/ NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

SECTION 9: Physical and chemical properties

Basic physical and chemical properties

Physical state	Solid
Appearance	Colourless, transparent, tabular, rhombic crystals or white crystalline powder, becoming gray or grayish-black on exposure to light in the presence of organic matter.
Color	Colourless to white
Odor	Odourless.
Odor threshold	
Melting point/freezing point	212 °C
Boiling point or initial boiling point and boiling range	No data available.
Flammability	Not combustible but assists combustion of other substances.

Lower and upper explosion limit/ flammability limit	No data available.
Flash point	No data available.
Explosive properties	Many reactions may cause explosion.; Reacts with ammonia to form compounds that are sensitive to mechanical shock.; Silver nitrate mixed with dry powdered magnesium may ignite explosively on contact with a drop of water.; An explosive fulminate may be formed if silver nitrate is mixed with alcohols.
Auto-ignition temperature	No data available.
Decomposition temperature	440 °C
Oxidizing properties	Strong oxidizer. Contact with other material may cause fire.
pH	Aqueous and alcoholic soln are neutral to litmus; pH 5.4 - 6.4 (100 g/l H2O).
Kinematic viscosity	No data available.
Solubility	Solubility in Water: Very soluble, 1220 g/l at 0 °C. Solubility in Organic Solvents: Readily soluble in ammonia water. Soluble in glycerol, diethyl ether and hot alcohol. Very slightly soluble in acetone.
Partition coefficient n-octanol/ water (log value)	No data available.
Vapor pressure	Not volatile
Density and/or relative density	Specific Gravity: 4.352
Relative vapor density	5.8
Particle characteristics	No data available.

SECTION 10: Stability and reactivity

Reactivity
Stable under normal conditions of storage and handling.

Reacts with incompatible materials

Chemical stability
Stable under recommended storage conditions.

Hygroscopic. Light sensitive.

Possibility of hazardous reactions
Reacts with acetylene in presence of ammonia to form silver acetylide, a sensitive powerful detonator when dry. In the absence of ammonia, or when calcium acetylide is added to a silver nitrate soln, explosive double salts of silver acetylide and silver nitrate are produced. Mercurous acetylide precipitates silver acetylide from aqueous nitrate. Reaction with chlorosulfonic acid is violent with nitrosulfonic acid being formed. Reduced by hydrogen sulfide in the dark. Easily reduced to metallic silver by ferrous salts, arsenites, hypophosphites, tartrates, sugars, tannins, volatile oils. Dry powdered magnesium and silver nitrate may ignite explosively on contact with a drop of water. Reaction with ammonium hydroxide, sodium hydroxide and stirring may be explosive. Reaction with phosphorus, or sulfur, and shock may be violently explosive. Reaction with charcoal and shock may result in ignition. Highly sensitive explosive is formed when calcium carbide is added to silver nitrate solution. Reaction with alcohols may form an explosive fulminate. When purified phosphine was passed rapidly into a concentrated solution of silver nitrate an explosion occurred.

Conditions to avoid
Heat, flame, sources of ignition, light, contamination and incompatible materials.

Incompatible materials
Reducing agents, combustible materials, organic materials, easily oxidized materials, acetylene + ammonia, acetylidene, alcohols, aldehydes, alkalis, alkali hydroxides, ammonia, ammonium
compounds, antimony salts, arsenites, benzalkonium chloride, bromides, carbonates, carbides, charcoal, chlorides, chlorosulfonic acid, creosote, ferrous salts, halogenated acids and their salts,
hydrazine and derivatives, hydrogen peroxide, hydrogen sulfide, hypophosphites, iodides, magnesium in powder form (with water), morphine salts, nitriles, non-metals, oils, organic nitro compounds,
phosphates, sodium hydroxide, sugars, tannic acid, tannins, tartrates, thimerosal, thiocyanates, vegetable decoctions, and extracts, volatile oils.

Hazardous decomposition products
Oxygen, toxic fumes, nitrous gases, toxic oxides of nitrogen, silver/silver oxides.

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity
Ingestion: Corrosive. Swallowing can cause severe burns of the mouth, throat, stomach and gastrointestinal tract. Can cause sore throat, vomiting, diarrhoea. Poison. Symptoms include pain and burning in the mouth, blackening of the skin and mucous membranes, throat, and abdomen, salivation, vomiting of black material, diarrhoea, collapse, shock, coma and death. Ingestion of soluble silver salts may cause argyria, characterized by permanent blue-gray pigmentation of the skin, mucous membranes, and eyes.

Inhalation: Destructive to tissues of the mucous membranes and upper respiratory tract. Symptoms may include severe irritation, burning sensation, coughing, wheezing, laryngitis, shortness of breath, breathing difficulty, headache, nausea, vomiting and possible coma. May be absorbed into the body following inhalation with symptoms paralleling those from ingestion exposure. Inhalation of silver metal dust and fume or of soluble silver compounds may eventually cause argyria, an unsightly blue-gray discoloration of the skin and mucous membranes, including gum tissue and conjunctiva of the eyes.

Skin corrosion/irritation
Corrosive. Symptoms of redness, pain, and severe burn can occur.

Serious eye damage/irritation
Corrosive. Can cause blurred vision, redness, pain, severe tissue burns and eye damage.

Respiratory or skin sensitization
Not classified based on available information.

Germ cell mutagenicity
Not classified based on available information.

Carcinogenicity
Not classified based on available information.
Nitrate or nitrite (ingested) under conditions that result in endogenous nitrosation are evaluated in the IARC Monographs (Vol. 94; in preparation) as Group 2A: Probably carcinogenic to humans.

Reproductive toxicity
Not classified based on available information.

Specific target organ toxicity (STOT) - single exposure
Not classified based on available information.

Specific target organ toxicity (STOT) - repeated exposure
Not classified based on available information.

Aspiration hazard
Not classified based on available information.

Additional information
Chronic Effects: May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death. Repeated inhalation may cause lung disease. Chronic inhalation or ingestion of silver salts may cause argyria characterized by a permanent blue-gray discolouration of the eyes, skin, mucous membranes, and internal organs. This malady results from the accumulation of silver in the body.

SECTION 12: Ecological information

Toxicity
Very toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

Disposal methods

Product disposal
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers.

Other disposal recommendations
Do not discharge this material into waterways, drains and sewers.

SECTION 14: Transport information

ADG (Road and Rail)
UN Number: 1493
Class: 5.1
Packing Group: II
Proper Shipping Name: SILVER NITRATE

Hazchem emergency action code (EAC)
1Y

IMDG
UN Number: 1493
Class: 5.1
Packing Group: II
EMS Number:
Proper Shipping Name: SILVER NITRATE

IATA
UN Number: 1493
Class: 5.1
Packing Group: II
Proper Shipping Name: SILVER NITRATE

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

Australia SUSMP
Poison Schedule: S6

SECTION 16: Other information

Further information/disclaimer
ChemSupply Australia Pty Ltd does not warrant that this product is suitable for any use or purpose. The user must ascertain the suitability of the product before use or application intended purpose. Preliminary testing of the product before use or application is recommended. Any reliance or purported reliance upon ChemSupply Australia Pty Ltd with respect to any skill or judgement or advice in relation to the suitability of this product of any purpose is disclaimed. Except to the extent prohibited at law, any condition implied by any statute as to the merchantable quality of this product or fitness for any purpose is hereby excluded. This product is not sold by description. Where the provisions of Part V, Division 2 of the Trade Practices Act apply, the liability of ChemSupply Australia Pty Ltd is limited to the replacement of supply of equivalent goods or payment of the cost of replacing the goods or acquiring equivalent goods.

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Standard for the Uniform Scheduling of Medicines and Poisons, Commonwealth of Australia
National Road Transport Commission, 'Australian Code for the Transport of Dangerous Goods by Road and Rail 7th. Ed.'
Safe Work Australia, 'National Code of Practice fot the Preparation of Safety Data Sheets for Hazardous Chemicals', July 2020.
Safe Work Australia, 'National Guide for Classifying Hazardous Chemicals', July 2020.
Safe Work Australia, Workplace Exposure Standards for Airbourne Contaminants, December 2019
Safe Work Australia, Hazardous Chemical Information System (HCIS), hcis.safeworkaustralia.gov.au
IATA, Dangerous Goods Regulations (DGR)
IMO, International Maritime Dangerous Goods Code (IMDG)