

Section 1 - Identification of the Substance / Mixture and of the Company / Undertaking

Product Identifier

Product Name	Silver Nitrate A.R Grade
Chemical Name	Silver Nitrate
Synonyms	Silver nitrate 63.5% Ag; Silver(I) nitrate; Nitric acid silver(1+) salt; Lunar caustic
Proper Shipping Name	SILVER NITRATE
Other Means of Identification	AgNO ₃
CAS Number	7761-88-8
EC Number	231-853-9

Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

Relevant identified uses	Laboratory use and manufacture of substances.
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Details of the Supplier of the Safety Data Sheet

Registered Company Name	Siltech PMR Pty Ltd
Address	7 / 220 Barry Road Campbellfield Vic 3061 Australia
Telephone	+61 3 9357 9540 (Business Hours)
Fax	
Website	http://www.siltechpmr.com.au
Email	bojanb@siltech.com.au

Emergency Telephone Number

Association / Organisation	Siltech PMR Pty Ltd
Emergency Telephone Numbers	+61 419 686 484

Section 2 - Hazards Identification

Classification of the Substances or Mixture

Hazardous Chemical. Dangerous Goods. According to the Model WHS Regulations and the ADG Code.

Poisons Schedule	S6
GHS Classification	Oxidising solid (Category 2) Corrosive to metals (Category 1) Skin corrosion/irritation (Category 1B) Serious eye damage/eye irritation (Category 1) Acute aquatic toxicity (Category 1) Chronic aquatic toxicity (Category 1)

Label Elements

GHS Label Elements	
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Signal Word	DANGER
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Hazard Statement(s)

H272	May intensify fire; oxidiser.
H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary Statement(s) Prevention

P210	Keep away from heat.
P220	Keep/store away from combustible materials.
P221	Take any precaution to avoid mixing with combustibles.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P264	Wash hands thoroughly after handling.
P273	Avoid release into the environment.
P280	Wear protective gloves / protective clothing /eye protection / face protection.

Precautionary Statement(s) Response

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/shower.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position 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 or doctor/physician.
P363	Wash contaminated clothing before reuse.

Precautionary Statement(s) Storage

P405	Store locked up.
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Precautionary Statement(s) Disposal

P501	Dispose of contents and container in accordance with national regulations.
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Other Hazards

Section 3 - Composition / Information on Ingredients

Substances

CAS No.	%[weight]	Name
7761-88-8	>99%	Silver Nitrate

Section 4 - First Aid Measures

Description of First Aid Measures

General Information	Immediately remove any clothing soiled by the product. Seek medical assistance immediately after an accident or if unwell.
Eye Contact	Rinse thoroughly with plenty of water for at least 15 minutes. Seek medical assistance.
Skin Contact	Take off contaminated clothing immediately. Wash off with soap and water. Seek medical assistance.
Inhalation	If breathed in, move person into fresh air. If not breathing, give artificial respiration. Seek medical assistance.
Ingestion	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Seek medical assistance.

Indication of any Immediate Medical Attention and Special Treatment Needed

No data available.

Section 5 - Firefighting Measures

Extinguishing Media

- Water spray
- CO₂
- Alcohol-resistant foam
- Dry chemical

Special Hazards Arising from the Substrate or Mixture

Fire Incompatibility	Nitrogen oxides (NO _x), Silver/silver oxides, container explosion may occur under fire conditions.
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Advice for Firefighters

Fire Fighting	Wear self-contained breathing apparatus for firefighting if necessary. Use water spray to cool unopened containers.
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Section 6 - Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures	Use personal protective equipment. Avoid dust formation. Avoid breathing dust, vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
Environmental Precautions	Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided. Inform emergency services in case of seepage into water course or sewage system.
Methods and materials for containment and cleaning up	Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations. Keep in a suitable, closed container for

	disposal. Ensure adequate ventilation.
Reference to other sections	For safe handling see section 7. For personal protection see section 8. For disposal see section 13.

Section 7 - Handling and Storage

Precautions for Safe Handling

Safe Handling	Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Keep away from heat and sources of ignition - no smoking.
Other Information	

Conditions for Safe Storage, Including any Incompatibilities

Suitable Container	Store in a cool place. Keep container tightly closed in a dry and well ventilated place.
Storage Incompatibility	Light sensitive. Store away from strong reducing agents, alcohols, ammonia, magnesium, strong bases.

Section 8 - Exposure Controls / Personal Protection

Control Parameters

Occupational Exposure Limits (OEL)

Ingredient Data

Source	Ingredient	Material Name	TWA	Notes
Australia. Workplace Exposure Standards for Airborne Contaminants	Silver Nitrate	Silver Nitrate	0.01 mg/m ³	

Emergency Limits

Exposure Controls

Appropriate Engineering Controls	General exhaust is adequate under normal operating conditions
Eye and Face Protection	Wear chemical goggles. Full face shield may be required for supplementary but never for primary protection of eyes. Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.
Skin Protection	Wear chemical protective gloves (PVC) and safety footwear (rubber). Select gloves tested to AS/NZS 2161.1
Body Protection	Protective work clothing such as overalls, PVC apron or protective suit if severe exposure. Be cautious of plastic personal protective equipment generating static electricity.
Respiratory Protection	Should comply with AS1716 and be selected in accordance with AS1715. In the event of emergency a full-face piece self-contained breathing apparatus should be used.

Section 9 - Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Appearance	Colourless crystalline
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Physical State	Solid	Relative Density (Water = 1)	4.350 g/cm ³
Odour	Odourless	Partition Coefficient n-octanol / water	log Pow: 5
Odour Threshold	Not applicable.	Auto-ignition Temperature (°C)	Not applicable.
pH (as supplied)	No data available.	Decomposition Temperature	440 °C
Melting Point / Freezing Point (°C)	Melting point/range: 212 °C	Viscosity (cSt)	3.77 cP @ 244 °C
Initial Boiling Point and Boiling Range (°C)	440 °C	Molecular Weight (g/mol)	169.8
Flash point (°C)	Product does not present an explosion hazard.	Taste	No data available.
Evaporation rate	Not applicable.	Explosive properties	Product does not present an explosion hazard.
Flammability	Product is not flammable.	Oxidising properties	Product is classified as oxidising with the category 2.
Upper Explosive Limit (%)	Product does not present an explosion hazard.	Surface Tension (dyn/cm or mN/m)	No data available.
Lower Explosive Limit (%)	Product does not present an explosion hazard.	Volatile Component (%vol)	Not applicable.
Vapour Pressure (kPa)	Not applicable.	Gas Group	No data available.
Solubility in Water (g/L)	2192 g/l	pH as a solution (1%)	6
Vapour Density (Air = 1)	Not applicable.	VOC g/L	No data available.

Section 10 - Stability and Reactivity

Reactivity	No further data available.
Chemical Stability	Decomposes on exposure to light. Stable under recommended storage conditions.
Thermal Decomposition	Decomposes at 440 °C
Possibility of Hazardous Reactions	<p>Reacts with acetylene in presence of ammonia to form silver acetylide, a sensitive powerful detonator when dry.</p> <p>In the absence of ammonia, or when calcium acetylide is added to a silver nitrate solution, explosive double salts of silver acetylide and silver nitrate are produced.</p> <p>Mercurous acetylide precipitates silver acetylide from aqueous nitrate.</p> <p>Reaction with chlorosulphonic acid is violent with nitrosulphonic acid being formed.</p> <p>Reduced by hydrogen sulphide in the dark.</p> <p>Easily reduced to metallic silver by ferrous salts, arsenates, hypophosphites,</p>

	<p>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 sulphur, 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 and explosive fulminate. When purified phosphine was passed rapidly into a concentrated solution of silver nitrate an explosion occurred.</p> <p>Hazardous polymerisation will not occur.</p>
Conditions to Avoid	Light.
Incompatible Materials	Strong reducing agents, alcohols, ammonia, magnesium, strong bases.
Hazardous Decomposition Products	Nitrogen oxides.

Section 11 - Toxicological Information

Information on Toxicological Effects

Acute toxicity	No data available.
Skin corrosion/irritation	Causes severe skin burns
Serious eye damage/eye irritation	Causes severe burns and eye damage
Respiratory or skin sensitisation	No data available.
Germ cell mutagenicity	No data available.
Carcinogenicity	IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
Reproductive toxicity	No data available.
Specific target organ toxicity - single exposure	No data available.
Specific target organ toxicity - repeated exposure	No data available.
Aspiration hazard	No data available.

Inhaled	<p>The material is not thought to produce adverse health effects following inhalation (as classified by EC Directives using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.</p> <p>Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.</p> <p>If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.</p> <p>Not normally a hazard due to non-volatile nature of product</p>
Ingestion	<p>Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.</p> <p>The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.</p> <p>The substance and/or its metabolites may bind to haemoglobin inhibiting normal uptake of oxygen. This condition, known as "methaemoglobinemia", is a form of oxygen starvation (anoxia). Symptoms include cyanosis (a bluish discolouration skin and mucous membranes) and breathing difficulties.</p> <p>Symptoms may not be evident until several hours after exposure. At about 15% concentration of blood methaemoglobin there is observable cyanosis of the lips, nose and earlobes. Symptoms may be absent although euphoria, flushed face and headache are commonly experienced. At 25-40%, cyanosis is marked but little disability occurs other than that produced on physical exertion. At 40-60%, symptoms include weakness, dizziness, lightheadedness, increasingly severe headache, ataxia, rapid shallow respiration, drowsiness, nausea, vomiting, confusion, lethargy and stupor. Above 60% symptoms include dyspnea, respiratory depression, tachycardia or bradycardia, and convulsions. Levels exceeding 70% may be fatal.</p> <p>Shock, gastroenteritis, and possible convulsions may follow ingestion.</p>
Skin Contact	<p>The material can produce chemical burns following direct contact with the skin.</p> <p>Skin contact is not thought to produce harmful health effects (as classified under EC Directives using animal models). Systemic harm, however, has been identified following exposure of animals by at least one other route and the material may still produce health damage following entry through wounds, lesions or abrasions. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects.</p> <p>Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p> <p>The material stains the skin.</p>

Eye	<p>The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.</p>
Chronic	<p>Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis.</p> <p>Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.</p> <p>Long term exposure to high dust concentrations may cause changes in lung function (i.e. pneumoconiosis) caused by particles less than 0.5 micron penetrating and remaining in the lung. A prime symptom is breathlessness. Lung shadows show on X-ray.</p> <p>Silver is one of the most physically and physiologically cumulative of the elements. Chronic exposure to silver salts may cause argyria, a permanent ashen-grey discolouration of the skin, conjunctiva and internal organs (due to the deposit of an insoluble albuminate of silver). The respiratory tract may also be a site of local argyria (following chronic inhalation exposures) with a mild chronic bronchitis being the only obvious symptom.</p> <p>Chronic dust deposits in lungs may resemble a form of pneumoconiosis, although it carries no form of fibrosis.</p>

	Toxicity	Irritation
Silver Nitrate	Oral (Mouse) LD50: 50 mg/kg	Eye (Rabbit): 1 mg, severe irritation

Section 12 - Ecological Information

Toxicity

Aquatic toxicity:

Persistence and degradability:

Behaviour in Environmental Systems

Bioaccumulative potential:

Mobility in soil:

Ecotoxicological Effects

Remark: Very toxic to fish.

Additional Ecological Information

General notes:

Must not reach sewage water or drainage ditch undiluted or unneutralised.

Also poisonous for fish and plankton in water bodies.

At present there are no ecotoxicological assessments.

Very toxic for aquatic organisms.

Danger to drinking water if even extremely small quantities leak into the ground.

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

Other adverse effects: No further relevant information available.



Section 13 - Disposal Considerations

Waste Treatment Methods

Recommendation	Offer surplus to a licensed disposal company. Dispose of according to relevant local, state and federal government regulations.	
Uncleaned Packaging:	Recommendation:	Disposal must be made according to national regulations. Packaging which is uncleaned or soiled with product remains is to be treated like the product itself. Packaging free of product remains is to be supplied refuse for recycling.
	Recommended cleansing agents:	Water, if necessary together with cleansing agents.

Section 14 - Transport Information

Labels Required

Oxidising Substances	
Marine Pollutant	
HAZCHEM	2X

Land Transport (ADG)

UN Number	1493	
Packing Group	II	
UN Proper Shipping Name	SILVER NITRATE	
Environmental Hazard	Environmental hazard	
Transport Hazard Class(es)	Class	5.1
	Subrisk	
Special Precautions for User	Special Provisions	No data available.
	Limited Quantity	1 kg

Air Transport (IATA - DGR)

UN Number	1493	
Packing Group	II	
UN Proper Shipping Name	Silver nitrate	
Environmental Hazard	No	
Transport Hazard Class(es)	ICAO / IATA Class	5.1

	ICAO / IATA Subrisk	
	ERG Code	No data available.
Special Precautions for User	No data available.	

Sea Transport (IMDG)

UN Number	1493	
Packing Group	II	
UN Proper Shipping Name	SILVER NITRATE, MARINE POLLUTANT	
Environmental Hazard	Marine pollutant	
Transport Hazard Class(es)	IMDG Class	5.1
	IMDG Subrisk	
Special Precautions for User	EMS Number	5.1-06
	Special Provisions	No data available.
	Limited Quantities	1 kg

Section 15 - Regulatory Information

Safety, Health and Environmental Regulations / Legislation Specific for the Substance or Mixture

National Inventory	Status
Australia - AICS	On the inventory, or in compliance with the inventory.
Canada - DSL	On the inventory, or in compliance with the inventory.
China - IECSC	On the inventory, or in compliance with the inventory.
Japan - ENCS	On the inventory, or in compliance with the inventory.
Korea - KECI	On the inventory, or in compliance with the inventory.
New Zealand - NZIoC	On the inventory, or in compliance with the inventory.
Philippines - PICCS	On the inventory, or in compliance with the inventory.

Section 16 - Other Information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Contact:

Siltech PMR
7 / 220 Barry Road
Campbellfield, Victoria, 3061
Australia

Abbreviations and acronyms:

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
VOCV: Swiss Ordinance on volatile organic compounds
VOC: Volatile Organic Compounds (USA, EU)



Safety Data Sheet
According to WHS and ADG requirements
Version 1.0

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LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

End of Safety Data Sheet