

SILVER NITRATE

Date of compilation: 26-07-2026 | Revised: 26-07-2026 | Version: 1

SECTION 1: IDENTIFICATION

1.1 GHS Product identifier:

SILVER NITRATE
Synonyms: Silver(I) nitrate; Lunar caustic
CAS: 7761-88-8

Other means of identification:

Not relevant

1.2 Recommended use of the chemical and restrictions on use:

Relevant uses: Electroplating/silvering baths, photographic and imaging chemicals, analytical/laboratory reagent (titration, qualitative analysis), mirror-silvering, catalyst, intermediate in manufacture of other silver compounds.
For industrial/laboratory user only.
Uses advised against: All uses not specified in this section or in section 7.3.

1.3 Supplier's details:

SURAJ CHEMICALS
No 92, Govindappa Naicken Street, Shiva Complex, Chennai – 600001, Tamil Nadu, India
Tel: +91 - 7092722822, +91 - 9840284032 / +91 - 44 - 25393652, 42130281
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GST No: 33ACEPV8190L1ZZ

1.4 Emergency phone number:

Emergency Contact No: +91 - 7092722822, +91 - 9840284032

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:

GHS:
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), per the established classification for silver nitrate.

Ox. Sol. 2	Oxidising solid, Category 2, H272
Skin Corr. 1B	Skin corrosion, Category 1B, H314
Aquatic Acute 1	Hazardous to the aquatic environment, acute hazard, Category 1, H400

2.2 GHS label elements, including precautionary statements:

GHS: Danger

Hazard statements:

H272 – May intensify fire; oxidizer.
H314 – Causes severe skin burns and eye damage.
H400 – Very toxic to aquatic life.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P220: Keep/store away from clothing and other combustible materials.
P221: Take any precaution to avoid mixing with combustibles.
P260: Do not breathe dust.
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): Remove/Take off immediately all contaminated clothing. Rinse skin with water/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 or doctor.
P370+P378: In case of fire: Use water spray/fog to extinguish.
P405: Store locked up.
P501: Dispose of contents/container in accordance with local/national regulations on hazardous waste.

2.3 Other hazards which do not result in classification:

Prolonged or repeated skin/eye contact, or ingestion, may cause argyria (blue-grey discolouration of skin, eyes and mucous membranes) due to deposition of silver. Strongly staining to skin, fabric and other materials.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances:

Chemical description: Silver Nitrate, AgNO₃;
In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 7761-88-8	Silver Nitrate — Ox. Sol. 2: H272; Skin Corr. 1B: H314; Aquatic Acute 1: H400 – Danger	≥ 99.5% (typical ACS/laboratory and technical grade)

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

3.2 Mixtures:

Non-applicable

SECTION 4: FIRST AID MEASURES

4.1 Description of necessary first-aid measures:

Request medical assistance immediately, showing the SDS of this product.

By inhalation:

Remove the person affected from the area of exposure, provide fresh air and keep at rest. Seek medical attention if symptoms occur or persist.

By skin contact:
Remove contaminated clothing immediately. Rinse affected skin with plenty of water/shower for at least 15 minutes. Seek medical attention immediately – causes severe skin burns.

By eye contact:
Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. Seek immediate medical attention – causes serious eye damage.

By ingestion/aspiration:
Rinse mouth with water. Do NOT induce vomiting. Seek immediate medical attention/call a Poison Control Centre, showing the SDS of this product.

4.2 Most important symptoms/effects, acute and delayed:
Acute: severe burns to skin, eyes and mucous membranes on contact; corrosive if swallowed. Delayed/chronic: argyria (irreversible blue-grey skin/eye pigmentation) with prolonged or repeated exposure.

4.3 Indication of immediate medical attention and special treatment needed, if necessary:
Treat as a chemical burn. Immediate ophthalmological consultation is required for eye exposure.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing media:
Suitable: Water spray/fog (preferred, to cool and dilute). Use large amounts of water as this product is an oxidiser.
Unsuitable: Dry chemical powder or CO₂; alone may not be fully effective against the oxidising hazard; do not use in a way that allows re-ignition.

5.2 Specific hazards arising from the chemical:
Oxidising solid – may intensify fire. Contact with combustible, organic or reducing materials may cause fire or increase fire intensity. On heating/combustion, may emit toxic nitrogen oxide and silver oxide fumes.

5.3 Special protective actions for fire-fighters:
Evacuate non-essential personnel. Wear self-contained breathing apparatus and full protective/acid-resistant clothing. Use large quantities of water to cool exposed containers.

Additional provisions:
Contain fire-fighting water run-off; do not allow to enter drains or watercourses – very toxic to aquatic life.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:
For non-emergency personnel:
Avoid contact with skin, eyes and clothing. Avoid generating dust. Use personal protective equipment described in section 8. Evacuate unprotected personnel and keep away from combustible materials.
For emergency responders:
Wear appropriate PPE including acid-resistant protective clothing and respiratory protection as needed. Keep unprotected persons away.

6.2 Environmental precautions:
Prevent entry into drains, watercourses and soil – very toxic to aquatic life. Notify relevant authorities in case of significant environmental release.

6.3 Methods and materials for containment and cleaning up:
Carefully sweep/vacuum up (avoid dust generation) and place in a suitable, labelled, closed, non-combustible container for disposal as hazardous waste, keeping away from combustible materials. Do not flush with water into drains. Do not use combustible materials (e.g. sawdust, paper towels) to absorb spillage.

6.4 Reference to other sections:
See sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling:
A. General precautions for safe use:
Avoid all contact with skin, eyes and clothing – corrosive. Avoid generating and breathing dust. Handle in a well-ventilated area or under local exhaust ventilation. Keep away from combustible/organic materials.
B. Technical recommendations for the prevention of fires and explosions:
Store and handle away from combustible materials, reducing agents and sources of heat/ignition due to oxidising properties. Containers must be used exclusively for this product.
C. Technical recommendations on general occupational hygiene:
Do not eat, drink or smoke while handling. Wash hands and exposed skin thoroughly after handling.
D. Technical recommendations to prevent environmental risks:
Prevent discharge to drains, soil and watercourses. Use dedicated containment for spills and waste.

7.2 Conditions for safe storage, including any incompatibilities:
A. Specific storage requirements:

Minimum Temp.	Ambient
Maximum Temp.	Ambient (cool, dry conditions, away from light)
Maximum time	Typical value – refer to current specification sheet

B. General conditions for storage:
Store in tightly closed, light-resistant (amber) containers in a cool, dry, well-ventilated, locked area away from combustible materials, reducing agents and direct sunlight. For additional information see subsection 10.5.

7.3 Specific end use(s):
Except for the instructions already specified, it is not necessary to provide any special recommendation regarding the uses of this product.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters:
Substances whose occupational exposure limits have to be assessed in the workplace, per the Factories Act, 1948, as amended, and generally referenced international occupational exposure limits for silver and soluble silver compounds:

Identification	Occupational Exposure Limit Type	Value
Silver Nitrate CAS: 7761-88-8	Time Weighted average (8 hrs), as Ag	0.01 mg/m³ (typical reference value for soluble silver compounds)

8.2 Appropriate engineering controls:
Use local exhaust ventilation/dust suppression to keep airborne concentrations below occupational exposure limits. Provide washing facilities and emergency shower/eyewash in work areas.

B. Respiratory protection:
Use a particulate respirator (P2/P3 or equivalent) where dust generation cannot be adequately controlled by engineering measures.

C. Specific protection for the hands:
Chemical-resistant protective gloves (e.g. nitrile or neoprene), rated for corrosive solids. Replace at any sign of damage.

D. Eye and face protection:
Chemical safety goggles and face shield – mandatory due to corrosive/eye-damage classification.

E. Bodily protection:
Acid/chemical-resistant protective clothing and apron. Safety footwear recommended. Note: product stains skin and fabric black/brown on exposure to light.

F. Additional emergency measures:
Emergency shower (ANSI Z358-1) and eyewash stations (ISO 3864-1) must be readily available in the work area.

Environmental exposure controls:

Prevent environmental discharge of product and contaminated wash-water. See subsection 7.1.D.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance	
Physical state at 20°C	Solid (crystals)
Appearance	Crystalline solid, darkens on exposure to light
Color	White / colourless
Odor	Odourless
Odour threshold	Not relevant *
Volatility	
Boiling point at atmospheric pressure	≈440°C (decomposes)
Vapour pressure at 20°C / 50°C	Negligible
Evaporation rate at 20°C	Not relevant *
Product Description	
Density / Relative density at 20°C	≈4.35 g/cm³
Dynamic / Kinematic viscosity	Not relevant *
Concentration	≥99.5% (typical)
pH	≈5.4–6.4 (aqueous solution, 50 g/L)
Vapour density at 20°C	Not relevant *
Partition coefficient n-octanol/water 20°C	Not relevant *
Solubility in water at 20°C	Readily soluble, ≈2220 g/L
Decomposition temperature	≈440°C
Melting point/freezing point	≈212°C
Flammability	
Flash Point	Non-applicable
Flammability (solid, gas)	Non-flammable (oxidiser; may intensify fire of other materials)
Autoignition temperature	Not relevant *
Lower / Upper flammability limit	Not relevant *
Particle Characteristics	
Median equivalent diameter	Typical value – refer to current specification sheet

* Not relevant due to the nature of the product, not providing information on the properties of its hazards.

9.2 Other information:

Explosive properties	Not relevant; may form explosive compounds with ammonia/organic materials over time (see 10.5)
Oxidising properties	H272 – May intensify fire; oxidizer
Corrosive to metals	Not relevant *
Heat of combustion	Not relevant *
Surface tension at 20°C	Not relevant *
Refraction index	Not relevant *

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity:

Strong oxidiser. Reacts violently with reducing agents, combustible and organic materials. Forms sensitive/explosive silver compounds (e.g. silver azide, silver fulminate) on prolonged contact with ammonia, amines, alcohols or certain organic compounds. Darkens on exposure to light (photosensitive).

10.2 Chemical stability:

Chemically stable under the indicated conditions of storage, handling and use, when protected from light, moisture and incompatible materials.

10.3 Possibility of hazardous reactions:

Avoid contact with ammonia, organic materials, reducing agents and combustible materials to prevent fire, violent reaction or formation of unstable/explosive silver compounds.

10.4 Conditions to avoid:

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Avoid with explosive silver compounds	Not applicable	Avoid – oxidiser, may intensify fire	Causes darkening – store protected from light	Avoid high humidity

10.5 Incompatible materials:

Combustible/Organic Materials	Ammonia / Amines	Reducing Agents	Alcohols	Metals (Copper, etc.)
Avoid contact – fire risk	Avoid – may form explosive silver azide/fulminate derivatives	Avoid contact – violent reaction	May form unstable compounds on prolonged contact	Displacement reactions possible

10.6 Hazardous decomposition products:

Thermal decomposition may release nitrogen oxides (NOx) and silver oxide/metallic silver fume.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:

In case of exposure that is repetitive, prolonged, or at concentrations higher than the recommended occupational exposure limits, adverse health effects may result depending on the means of exposure:

- A. Ingestion (acute effect):**
- Corrosive; causes severe burns to the mouth, throat, oesophagus and stomach. May cause systemic toxicity.
- B. Inhalation (acute effect):**
- Inhalation of dust/mist may cause irritation and corrosive damage to respiratory passages.

C. Contact with skin and eyes (acute effect):
Causes severe skin burns (H314) and serious eye damage. Also stains skin black/grey-brown on contact with light.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity):
Classification criteria for carcinogenicity, mutagenicity and reproductive toxicity are not met based on available data. IARC: Not listed.

E. Sensitizing effects:
Classification criteria for respiratory or skin sensitisation are not met based on available data.

F. Specific target organ toxicity (STOT) – single exposure:
Classification criteria are not met based on available data.

G. Specific target organ toxicity (STOT) – repeated exposure:
Classification criteria are not met based on available data. Chronic/repeated exposure is associated with argyria (irreversible blue-grey discolouration of skin and eyes) due to deposition of silver in tissues.

H. Aspiration hazard:
Not applicable (solid).

Product-specific toxicological information:

Identification	Acute Toxicity	Genus
Silver Nitrate CAS: 7761-88-8	LD50 oral: ≈50–1870 mg/kg (published range)	Rat
	LD50 dermal: Not established	–

SECTION 12: ECOLOGICAL INFORMATION

Very toxic to aquatic life.

12.1 Toxicity:

Acute Toxicity	Species	Genus
LC50: <0.01–0.1 mg/L (96h), as Ag (silver is highly toxic to aquatic organisms even at trace concentrations)	Non-applicable	Fish
EC50: <0.01–0.1 mg/L (48h), as Ag	Non-applicable	Crustacean

12.2 Persistence and degradability:
Inorganic substance; biodegradability concept not applicable. The silver ion persists in the environment but is rapidly bound/precipitated by organic matter, sulfides and chlorides, reducing bioavailability.

12.3 Bioaccumulative potential:
Silver can bioaccumulate in some aquatic organisms, though bioavailable free Ag+ is typically rapidly complexed in natural waters.

12.4 Mobility in soil:

Koc	Henry	Dry Soil	Moist Soil
Not relevant	Not relevant	Low (binds strongly to soil/sulfides)	Low (binds strongly to soil/sulfides)

12.5 Results of PBT and vPvB assessment:
Not applicable under standard organic PBT/vPvB criteria (inorganic substance).

12.6 Other adverse effects:
Extremely toxic to algae, bacteria and aquatic microorganisms even at very low (sub-ppm) concentrations.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Disposal methods:
Dispose of as hazardous waste (oxidiser/heavy-metal-bearing) through a licensed hazardous waste contractor/TSDF in accordance with the Hazardous and Other Wastes (Management and Transboundary Movement) Rules. Do not discharge to drains or water bodies. Recover/recycle silver where feasible via a licensed silver-recovery facility. For packaging: use dedicated, non-combustible containers; do not rinse into general drains. Refer to national and local regulations on waste management.

SECTION 14: TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR 2023 / RID 2023):

14.1 UN number	UN1493
14.2 UN proper shipping name	SILVER NITRATE
14.3 Transport hazard class(es)	5.1 (Labels: 5.1, 8)
14.4 Packing group	II
14.5 Environmental hazard	Yes
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by sea (IMDG 41-22):

14.1 UN number	UN1493
14.2 UN proper shipping name	SILVER NITRATE
14.3 Transport hazard class(es)	5.1 (Labels: 5.1, 8)
14.4 Packing group	II
14.5 Marine pollutant	Yes
14.6 Special precautions for user	EmS Codes: F-A, S-Q
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by air (IATA/ICAO 2024):

14.1 UN number	UN1493
14.2 UN proper shipping name	SILVER NITRATE
14.3 Transport hazard class(es)	5.1 (Labels: 5.1, 8)
14.4 Packing group	II
14.5 Environmental hazard	Yes
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

SECTION 15: REGULATORY INFORMATION

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

It is recommended to use the information included in this safety data sheet as data used in a risk evaluation of local circumstances, in order to establish the necessary risk prevention measures for the manipulation, use, storage and disposal of this product.

Other legislation:

- Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989
- The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)
- Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016
- The Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996

SECTION 16: OTHER INFORMATION

Legislation related to safety data sheets:

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3:

- H272: May intensify fire; oxidizer.
- H314: Causes severe skin burns and eye damage.
- H400: Very toxic to aquatic life.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training:

Personnel handling this product should receive training on corrosive/oxidiser hazards, safe handling practices, and the use of personal protective equipment, to ensure correct interpretation and application of this safety data sheet and the product label.

Principal bibliographical sources:

The United Nations Economic Commission for Europe (UNECE); publicly available harmonized GHS/CLP classification references for CAS 7761-88-8 (silver nitrate).

Abbreviations and acronyms:

ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ICAO: International Civil Aviation Organisation | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | Koc: Partition coefficient of organic carbon | IARC: International Agency for Research on Cancer

The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

END OF SAFETY DATA SHEET