



MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name SILVER NITRATE, REAGENT (ACS)
Catalog # 378
Version # 02
Revision date 21-Jul-2009
CAS # 7761-88-8
Manufacturer information GFS Chemicals, Inc.
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Powell, OH 43065 US
www.gfschemicals.com
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2. Hazards Identification

Emergency overview DANGER -- OXIDIZER
Contact with combustible material may cause fire.

May be fatal if swallowed. Irritating to skin. Irritating to eyes.

OSHA regulatory status This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

Potential health effects

Routes of exposure Ingestion. Skin contact. Eye contact.

Eyes Causes eye irritation. Avoid contact with eyes.

Skin Irritating to skin. Avoid contact with the skin.

Inhalation Avoid breathing dust/fume/gas/mist/vapors/spray.

Ingestion Very toxic if swallowed. Do not ingest.

Potential environmental effects Components of this product are hazardous to aquatic life. May cause long-term adverse effects in the environment.

3. Composition / Information on Ingredients

| Components | CAS # | Percent |
|----------------|-----------|----------|
| SILVER NITRATE | 7761-88-8 | 90 - 100 |

4. First Aid Measures

First aid procedures

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation persists after washing.

Skin contact Remove and isolate contaminated clothing and shoes. Wash off immediately with plenty of water. If skin irritation persists, call a physician.

Inhalation If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.

Ingestion Have victim rinse mouth thoroughly with water. Never give anything by mouth to a victim who is unconscious or is having convulsions. Do not induce vomiting without advice from poison control center. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If material is ingested, immediately contact a poison control center.

Notes to physician In case of shortness of breath, give oxygen. Keep victim warm. Symptoms may be delayed.

General advice In case of shortness of breath, give oxygen. Keep victim warm. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties May explode from heat or contamination. Contact with combustible material may cause fire. These substances will accelerate burning when involved in a fire. Some will react explosively with hydrocarbons (fuels). Some may decompose explosively when heated or involved in a fire. Runoff may create fire or explosion hazard.

Extinguishing media

Suitable extinguishing media Water.

Protection of firefighters

Protective equipment and precautions for firefighters Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Do not move cargo or vehicle if cargo has been exposed to heat. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. ALWAYS stay away from tanks engulfed in flame. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Move containers from fire area if you can do so without risk. In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers. Cool containers exposed to flames with water until well after the fire is out. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out.

Specific methods In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers.

6. Accidental Release Measures

Personal precautions Keep unnecessary personnel away. Isolate spill or leak area immediately for at least 50 to 100 meters (150 to 330 feet) in all directions. Keep upwind. Keep out of low areas. Keep people away from and upwind of spill/leak. Ventilate closed spaces before entering them. Ensure adequate ventilation. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Environmental precautions Prevent further leakage or spillage if safe to do so. Runoff from fire control or dilution water may cause pollution. Do not contaminate water.

Methods for containment Stop leak if you can do so without risk. Keep combustibles (wood, paper, oil, etc.) away from spilled material. Prevent entry into waterways, sewers, basements or confined areas.

Methods for cleaning up Should not be released into the environment. Sweep up or vacuum up spillage and collect in suitable container for disposal. Avoid dust formation. Following product recovery, flush area with water.

7. Handling and Storage

Handling Do not handle or store near an open flame, heat or other sources of ignition. Keep away from clothing and other combustible materials. Avoid contact with skin. Avoid contact with eyes. Use only with adequate ventilation. Wear personal protective equipment. Wash thoroughly after handling. Avoid release to the environment.

Storage Store in a well-ventilated place. Store in a cool place in original container and protect from sunlight. Keep container tightly closed. Do not store near combustible materials. Keep out of the reach of children. Use care in handling/storage.

8. Exposure Controls / Personal Protection

Occupational exposure limits

ACGIH

| Material | CAS # | Type | Value | Form |
|----------------|-----------|------|------------|------|
| SILVER NITRATE | 7761-88-8 | TWA | 0.01 mg/m3 | |

U.S. - OSHA

| Material | CAS # | Type | Value | Form |
|----------------|-----------|------|------------|------|
| SILVER NITRATE | 7761-88-8 | PEL | 0.01 mg/m3 | |
| | | TWA | 0.01 mg/m3 | |

Engineering controls Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Respiratory protection Wear positive pressure self-contained breathing apparatus (SCBA).

Hand protection Wear protective gloves.

Eye / face protection Avoid contact with eyes. Wear chemical goggles.

Skin protection Avoid contact with the skin. Wear appropriate chemical resistant clothing. Wear protective gloves.

General hygiene considerations When using do not smoke. Avoid contact with eyes. Avoid contact with skin. Keep away from food and drink. Handle in accordance with good industrial hygiene and safety practice.

General Avoid contact with skin. Avoid contact with eyes.

9. Physical & Chemical Properties

| | |
|---|-----------------------------|
| Appearance | Crystalline. |
| Color | White. |
| Odor | Odorless. |
| Odor threshold | Not available. |
| Physical state | Solid. |
| Form | Solid. |
| pH | 6 |
| Melting point | 413.6 °F (212 °C) estimated |
| Freezing point | 413.6 °F (212 °C) |
| Boiling point | 824 °F (440 °C) |
| Flash point | Not available. |
| Evaporation rate | Not available. |
| Flammability | Not available. |
| Flammability limits in air, upper, % by volume | Not available. |
| Flammability limits in air, lower, % by volume | Not available. |
| Vapor pressure | Not available. |
| Vapor density | Not available. |
| Specific gravity | 5.35 |
| Relative density | 5.3495 g/cm3 estimated |
| Solubility (water) | Not available. |
| Partition coefficient (n-octanol/water) | Not available. |
| Auto-ignition temperature | Not available. |
| Decomposition temperature | Not available. |
| Molecular weight | 169.8700 g/mol |
| Molecular formula | AgNO3 |

10. Chemical Stability & Reactivity Information

| | |
|---|---|
| Chemical stability | Stable at normal conditions. |
| Conditions to avoid | Exposure to light. |
| Hazardous decomposition products | May include oxides of nitrogen. May include oxides of silver. |
| Possibility of hazardous reactions | Hazardous polymerization does not occur. |

11. Toxicological Information

Acute effects

Acute Oral: LD 50

SILVER NITRATE 7761-88-8 Mouse 50 mg/kg

Acute Toxicity other routes: LD 50

SILVER NITRATE 7761-88-8 Mouse 23.783 mg/kg Intraperitoneal

SILVER NITRATE 7761-88-8 Mouse 13.9 mg/kg Intraperitoneal Male

Toxicology data for the preparation

Acute LD50: 13.9 mg/kg, Mouse, Other

Acute LD50: 23.78 mg/kg, Mouse, Other

Acute LD50: 50 mg/kg, Mouse, Oral

Local effects

Irritating to eyes. Irritating to skin.

Carcinogenicity

This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

12. Ecological Information

Ecotoxicity

Components of this product are hazardous to aquatic life.

Aquatic plant toxicity: EC 50

SILVER NITRATE 7761-88-8 Green algae (*Scenedesmus dimorphus*) 0.003 - 0.015 mg/l 48 h Static Intoxication

Invertebrate Toxicity: EC 50

SILVER NITRATE 7761-88-8 Scud (*Gammarus pseudolimnaeus*) 0.0037 - 0.0055 mg/l 72 h Flow through Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.0039 mg/l 64 h Static Intoxication

SILVER NITRATE 7761-88-8 Leech (*Nepheleopsis obscura*) 0.095 mg/l 96 h Static Intoxication

SILVER NITRATE 7761-88-8 Scud (*Gammarus pseudolimnaeus*) 0.0037 - 0.0055 mg/l 96 h Flow through Intoxication

SILVER NITRATE 7761-88-8 Rotifer (*Philodina acuticornis*) 1.4 mg/l 96 h Static Intoxication

SILVER NITRATE 7761-88-8 Tubificid worm (*Tubifex tubifex*) 0.021 - 0.055 mg/l 96 h Renewal Intoxication

SILVER NITRATE 7761-88-8 Rotifer (*Philodina acuticornis*) 15.7 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Rotifer (*Philodina acuticornis*) 3.8 mg/l 24 h Static Intoxication

SILVER NITRATE 7761-88-8 Rotifer (*Philodina acuticornis*) 5.3 mg/l 24 h Static Intoxication

SILVER NITRATE 7761-88-8 Ostracod (*Cypris subglobosa*) 0.0035 - 0.0042 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Amphipod (*Crangonyx pseudogracilis*) 0.005 - 0.006 mg/l 48 h Renewal Intoxication

SILVER NITRATE 7761-88-8 Scud (*Gammarus pseudolimnaeus*) 0.0038 - 0.0058 mg/l 24 h Flow through Intoxication

SILVER NITRATE 7761-88-8 Scud (*Gammarus pseudolimnaeus*) 0.0038 - 0.0058 mg/l 48 h Flow through Intoxication

SILVER NITRATE 7761-88-8 Rotifer (*Philodina acuticornis*) 1.7 mg/l 96 h Static Intoxication

SILVER NITRATE 7761-88-8 Tubificid worm (*Tubifex tubifex*) 0.033 - 0.046 mg/l 48 h Renewal Intoxication

SILVER NITRATE 7761-88-8 Tubificid worm (*Tubifex tubifex*) 0.035 - 0.048 mg/l 24 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Alona affinis*) 0.025 - 0.056 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Ceriodaphnia reticulata*) 0.0011 - 0.0017 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Ceriodaphnia reticulata*) 0.0064 mg/l 7 d Renewal Mortality

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.0008 - 0.001 mg/l 48 h Flow through Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.0008 - 0.0011 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.0009 - 0.0012 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.001 - 0.0011 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.0013 - 0.0018 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.0023 - 0.0036 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.0029 mg/l 21 d Renewal Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.0036 mg/l 21 d Renewal Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.0036 mg/l 7 d Renewal Mortality

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.0039 mg/l 21 d Renewal Intoxication

SILVER NITRATE 7761-88-8 Dungeness or edible crab (*Cancer magister*) 0.016 - 0.087 mg/l 96 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.0054 - 0.0156 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.006 - 0.008 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.0075 - 0.0092 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.0109 - 0.0143 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.0143 - 0.0155 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.015 - 0.02 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.016 - 0.024 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.017 - 0.023 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.017 - 0.034 mg/l 24 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.02 - 0.04 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.042 - 0.054 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia magna*) 0.052 - 0.059 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia pulex*) 0.0017 - 0.0023 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Water flea (*Daphnia pulex*) 0.0027 mg/l 7 d Renewal Mortality

SILVER NITRATE 7761-88-8 Water flea (*Moina dubia*) 0.0025 - 0.0082 mg/l 48 h Static Intoxication

SILVER NITRATE 7761-88-8 Amphipod (*Crangonyx pseudogracilis*) 0.004 - 0.005 mg/l 96 h Renewal Intoxication

Micro-organisms Toxicity: LC 50

SILVER NITRATE 7761-88-8 Protozoa (*Spirostomum ambiguum*) 0.009 mg/l 24 h Static Mortality

SILVER NITRATE 7761-88-8 Protozoa (*Spirostomum ambiguum*) 0.0088 mg/l 48 h Static Mortality

SILVER NITRATE 7761-88-8 Nematode (*Caenorhabditis elegans*) 3 - 10 mg/l 24 h Static Mortality

SILVER NITRATE 7761-88-8 Nematode (*Caenorhabditis elegans*) 1 - 7 mg/l 72 h Static Mortality

SILVER NITRATE 7761-88-8 Nematode (*Caenorhabditis elegans*) 1 - 10 mg/l 48 h Static Mortality

SILVER NITRATE 7761-88-8 Nematode (*Caenorhabditis elegans*) 0.1 - 4.98 mg/l 96 h Static Mortality

Environmental effects

Harmful to aquatic life.

Persistence and degradability

Not available.

13. Disposal Considerations

| | |
|------------------------------|---|
| Waste codes | D001: Waste Flammable material with a flash point <140 F D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel] |
| Disposal instructions | Collect for silver recovery. Dispose of this material and its container at hazardous or special waste collection point. Do not allow this material to drain into sewers/water supplies. If discarded, this product is considered a RCRA ignitable waste, D001. Dispose in accordance with all applicable regulations. |

14. Transport Information

DOT

Basic shipping requirements:

| | |
|--------------------------------|--------------------|
| Proper shipping name | Silver nitrate |
| Hazard class | 5.1 |
| UN number | UN1493 |
| Packing group | II |
| Additional information: | |
| Special provisions | IB8, IP4, T3, TP33 |
| Packaging exceptions | 152 |
| Packaging non bulk | 212 |
| Packaging bulk | 242 |
| Reportable quantity | 1 |
| ERG number | 140 |



15. Regulatory Information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

SILVER NITRATE 7761-88-8 1.0 % N740

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

SILVER NITRATE 7761-88-8 N740 Listed.

CERCLA (Superfund) reportable quantity

SILVER NITRATE, REAGENT (ACS): 1.0000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

Section 302 extremely hazardous substance No

Section 311 hazardous chemical Yes

Inventory status

| Country(s) or region | Inventory name | On inventory (yes/no)* |
|-----------------------------|---|------------------------|
| Australia | Australian Inventory of Chemical Substances (AICS) | Yes |
| Canada | Domestic Substances List (DSL) | Yes |
| Canada | Non-Domestic Substances List (NDSL) | No |
| China | Inventory of Existing Chemical Substances in China (IECSC) | Yes |
| Europe | European Inventory of New and Existing Chemicals (EINECS) | Yes |
| Europe | European List of Notified Chemical Substances (ELINCS) | No |
| Japan | Inventory of Existing and New Chemical Substances (ENCS) | Yes |
| Korea | Existing Chemicals List (ECL) | No |
| New Zealand | New Zealand Inventory | Yes |
| Philippines | Philippine Inventory of Chemicals and Chemical Substances (PICCS) | Yes |
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | Yes |

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US - New Jersey Community RTK (EHS Survey): Reportable threshold

SILVER NITRATE 7761-88-8 500 LBS

US - Pennsylvania RTK - Hazardous Substances: Listed substance

SILVER NITRATE 7761-88-8 Listed.

16. Other Information

Further information

HMIS® is a registered trade and service mark of the NPCA.

HMIS® ratings

Health: 3
Flammability: 0
Physical hazard: 2

NFPA ratings

Health: 3
Flammability: 0
Instability: 0
Special hazards: OX

Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available. The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Issue date

21-Jul-2009

This data sheet contains changes from the previous version in section(s):

This document has undergone significant changes and should be reviewed in its entirety.