

**Material Safety Data Sheet**  
According to OSHA and ANSI

Printing date 04/21/2011

Reviewed on 03/03/2011

**1 Identification of the substance/mixture and of the company/undertaking****Product identifier****Product name:** Silver nitrate**Stock number:** 10858**CAS Number:**

7761-88-8

**EINECS Number:**

231-853-9

**Index number:**

047-001-00-2

**Relevant identified uses of the substance or mixture and uses advised against.****Sector of Use** SU24 Scientific research and development**Details of the supplier of the safety data sheet****Manufacturer/Supplier:**

Alfa Aesar, A Johnson Matthey Company

Johnson Matthey Catalog Company, Inc.

30 Bond Street

Ward Hill, MA 01835-8099

Emergency Phone: (978) 521-6300

CHEMTREC: (800) 424-9300

Web Site: www.alfa.com

**Information Department:** Health, Safety and Environmental Department**Emergency telephone number:**

During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

**2 Hazards identification****Classification of the substance or mixture**

GHS05 Corrosion

H314 Causes severe skin burns and eye damage.



GHS09 Environment

H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

**Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

C; Corrosive

R34: Causes burns.



O; Oxidizing

R8: Contact with combustible material may cause fire.



N; Dangerous for the environment

R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Information concerning particular hazards for human and environment:** Not applicable**Label elements****Labelling according to EU guidelines:**

The product has been classified and marked in accordance with directives on hazardous materials.

**Code letter and hazard designation of product:**

C Corrosive

O Oxidizing

N Dangerous for the environment

**Risk phrases:**

8 Contact with combustible material may cause fire.

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34 Causes burns. (Contd. of page 1)  
50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

**Safety phrases:**

26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
36/37/39 Wear suitable protective clothing, gloves and eye/face protection.  
45 In case of accident or if you feel unwell, seek medical advice immediately.  
60 This material and its container must be disposed of as hazardous waste.  
61 Avoid release to the environment. Refer to special instructions/Safety data sheets

**Hazard description:****WHMIS classification**

C - Oxidizing materials  
D2A - Very toxic material causing other toxic effects  
E - Corrosive material

**Classification system****HMIS ratings (scale 0-4)**

(Hazardous Materials Identification System)

HEALTH	2	Health (acute effects) = 2
FIRE	3	Flammability = 3
REACTIVITY	3	Reactivity = 3

**Other hazards****Results of PBT and vPvB assessment**

PBT: Not applicable.  
vPvB: Not applicable.

**3 Composition/information on ingredients****Chemical characterization: Substances****(CAS#) Description:**

7761-88-8 Silver nitrate

**Identification number(s):**

EINECS Number: 231-853-9

Index number: 047-001-00-2

**4 First aid measures****Description of first aid measures****General information** Immediately remove any clothing soiled by the product.**After inhalation**

Supply fresh air or oxygen; call for doctor.

In case of unconsciousness place patient stably in side position for transportation.

Supply fresh air. If required, provide artificial respiration. Keep patient warm.

Seek immediate medical advice.

**After skin contact**

Immediately wash with water and soap and rinse thoroughly.

Seek immediate medical advice.

**After eye contact**

Call a doctor immediately.

Rinse opened eye for several minutes under running water. Then consult a doctor.

**After swallowing**

Drink copious amounts of water and provide fresh air. Immediately call a doctor.

Do not initiate vomiting.

Seek immediate medical advice.

**Information for doctor****Most important symptoms and effects, both acute and delayed**

No further relevant information available.

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**Danger**

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Silver nitrate is caustic and irritating to the skin, eyes and mucous membranes, producing a persistent black stain, with possible tissue destruction. Absorption over a long period may cause "Argyria", a blue/grey discolouration of various tissues. Industrial argyria may be local, involving the formation of blue/grey particles in the skin and the conjunctivae, or generalised, which appears early on the face, spreading to the hands. This is only normally manifest after many years of gross over-exposure. Ingestion will cause violent abdominal pain and vomiting.

Absorption over a long period may cause "Argyria", a blue/grey discolouration of various tissues. Industrial argyria may be local, involving the formation of blue/grey particles in the skin and the conjunctivae, or generalised, which appears early on the face, spreading to the hands. This is only normally manifested after many years of over-exposure.

**Indication of any immediate medical attention and special treatment needed**

No further relevant information available.

**5 Firefighting measures**

**Extinguishing media**

**Suitable extinguishing agents**

Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

**Special hazards arising from the substance or mixture**

In case of fire, the following can be released:

Nitrogen oxides (NOx)

Metal oxide fume

This substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.

**Advice for firefighters**

**Protective equipment:**

Wear self-contained respirator.

Wear fully protective impervious suit.

**6 Accidental release measures**

**Personal precautions, protective equipment and emergency procedures**

Wear protective equipment. Keep unprotected persons away.

**Environmental precautions:**

Do not allow to enter sewers/ surface or ground water.

Do not allow to penetrate the ground/soil.

**Methods and material for containment and cleaning up:**

Pick up mechanically.

Ensure adequate ventilation.

Dispose contaminated material as waste according to item 13.

**Reference to other sections** See Section 8 for information on personal protection equipment.

**7 Handling and storage**

**Handling**

**Precautions for safe handling**

Thoroughly remove all dust particles.

Keep container tightly sealed.

Store in cool, dry place in tightly closed containers.

Ensure good ventilation at the workplace.

**Information about protection against explosions and fires:**

Keep respiratory protective device available.

Substance/product can reduce the ignition temperature of flammable substances.

This substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.

**Conditions for safe storage, including any incompatibilities**

**Storage**

**Requirements to be met by storerooms and receptacles:**

Due to photo-sensitivity, store product in brown-glass or stainless steel receptacles.

**Information about storage in one common storage facility:**

Store away from flammable substances.

Store away from reducing agents.

Store in the dark.

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Do not store with organic materials.

Store away from metal powders.

**Further information about storage conditions:**

Store in the dark.

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

Protect from exposure to light.

**Specific end use(s)** No further relevant information available.

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**8 Exposure controls/personal protection****Additional information about design of technical systems:**

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

**Control parameters****Components with limit values that require monitoring at the workplace:**

Silver, soluble compounds, as Ag

	mg/m <sup>3</sup>
ACGIH TLV	0.01
Austria MAK	0.01
Belgium TWA	0.1
Denmark TWA	0.01
Finland TWA	0.1
France VME	0.1
Germany MAK	0.01
Netherlands TWA	0.01
Japan OEL	0.01
Korea TLV	0.1
Netherlands MAC-TGG	0.01
Norway TWA	0.01
Russia	1-STEL
Sweden NGV	0.1
United Kingdom TWA	0.01
Russia TWA	1-STEL
Switzerland MAK-W	0.01
Finland TWA	0.1
Ireland TWA	0.01
USA PEL	0.01

**7761-88-8 Silver nitrate (100.0%)**

PEL	0.01 mg/m <sup>3</sup> as Ag
REL	0.01 mg/m <sup>3</sup> as Ag
TLV	0.01 mg/m <sup>3</sup> as Ag

**Additional information:** No data**Exposure controls****Personal protective equipment****General protective and hygienic measures**

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes and skin.

**Breathing equipment:** Use suitable respirator when high concentrations are present.**Protection of hands:**

Check protective gloves prior to each use for their proper condition.

Impervious gloves

**Material of gloves**

The selection of suitable gloves not only depends on the material, but also on quality.

Quality will vary from manufacturer to manufacturer.

**Eye protection:**

Safety glasses

Tightly sealed goggles

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Full face protection  
Body protection: Protective work clothing.

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**9 Physical and chemical properties****Information on basic physical and chemical properties****General Information****Appearance:**

Form: Crystalline  
Color: White  
Odor: Odorless  
Odour threshold: Not determined.

pH-value: Not applicable.

**Change in condition**

Melting point/Melting range: 212°C (414 °F)  
Boiling point/Boiling range: Not determined  
Sublimation temperature / start: Not determined

Flash point: Not applicable

Flammability (solid, gaseous) Contact with combustible material may cause fire.  
Contact with combustible material may cause fire.

Ignition temperature: Not determined

Decomposition temperature: Not determined

Auto igniting: Not determined.

**Explosion limits:**

Lower: Not determined  
Upper: Not determined

Vapor pressure: Not applicable.

Density at 20°C (68 °F): 4.352 g/cm<sup>3</sup> (36.317 lbs/gal)  
Relative density: Not determined.  
Vapour density: Not applicable.  
Evaporation rate: Not applicable.

**Solubility in / Miscibility with**

Water: Soluble  
Alcohols: Slightly soluble  
Ketones: Slightly soluble

Segregation coefficient (n-octanol/water): Not determined.

**Viscosity:**

dynamic: Not applicable.  
kinematic: Not applicable.  
Other information: No further relevant information available.

**10 Stability and reactivity****Reactivity****Chemical stability****Thermal decomposition / conditions to be avoided:**

Decomposition will not occur if used and stored according to specifications.  
To avoid thermal decomposition do not overheat.

**Possibility of hazardous reactions**

Reacts with reducing agents  
Reacts with organic substances  
Acts as an oxidizing agent on organic materials such as wood, paper and fats

**Incompatible materials:**

Reducing agents  
Metal powders  
Light

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**Product name: Silver nitrate**
**Hazardous decomposition products:**

 Nitrogen oxides (NOx)  
 Metal oxide fume

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## 11 Toxicological information

**Information on toxicological effects**
**Acute toxicity:**
**LD/LC50 values that are relevant for classification:**

Oral	LD50	1173 mg/kg (rat)
Irritation of eyes	severe	1 mg (rabbit)

**Primary irritant effect:**
**on the skin:** Corrosive effect on skin and mucous membranes.

**on the eye:** Strong corrosive effect.

**Sensitization:** No sensitizing effects known.

**Other information (about experimental toxicology):**

Mutagenic effects have been observed on tests with laboratory animals.

Mutagenic effects have been observed on tests with bacteria.

Reproductive effects have been observed on tests with laboratory animals.

Tumorigenic effects have been observed on tests with laboratory animals.

**Subacute to chronic toxicity:**

Small doses of nitrates may cause weakness, general depression, headache and mental impairment. Larger doses may cause dizziness, abdominal cramps, vomiting, bloody diarrhea, convulsions and collapse.

Absorption of silver compounds by ingestion, inhalation or through broken skin can cause argyria, a permanent bluish-grey discoloration of the skin, conjunctiva and mucous membranes.

**Subacute to chronic toxicity:**

Corrosive materials are acutely destructive to the respiratory tract, eyes, skin and digestive tract. Eye contact may result in permanent damage and complete vision loss.

Inhalation may result in respiratory effects such as inflammation, edema, and chemical pneumonitis. May cause coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting.

Ingestion may cause damage to the mouth, throat and esophagus. May cause skin burns or irritation depending on the severity of the exposure.

**Additional toxicological information:**

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.

No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

## 12 Ecological information

**Toxicity**
**Acquatic toxicity:** No further relevant information available.

**Persistence and degradability** No further relevant information available.

**Behavior in environmental systems:**
**Bioaccumulative potential** No further relevant information available.

**Mobility in soil** No further relevant information available.

**Ecotoxicological effects:**
**Remark:** Very toxic for aquatic organisms

**Additional ecological information:**
**General notes:**

Do not allow product to reach ground water, water course or sewage system, even in small quantities.

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

Also poisonous for fish and plankton in water bodies.

Do not allow material to be released to the environment without proper governmental permits.

Very toxic for aquatic organisms

**Results of PBT and vPvB assessment**
**PBT:** Not applicable.

**vPvB:** Not applicable.

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Other adverse effects No further relevant information available.

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**13 Disposal considerations****Waste treatment methods****Recommendation**

Contact waste processors for recycling information.

Consult state, local or national regulations to ensure proper disposal.

**Waste disposal key number according to the European Waste Catalogue:**

Contaminated salts and their solutions:

06 03 99 Wastes n. o. s.

**Uncleaned packagings:****Recommendation:** Disposal must be made according to official regulations.**Recommended cleansing agent:** Water, if necessary with cleansing agents.**14 Transport information****DOT regulations:**

**Hazard class:** 5.1  
**Identification number:** UN1479  
**Packing group:** I  
**Proper shipping name (technical name):** OXIDIZING SOLID, N.O.S. (Silver nitrate)  
**Label:** 5.1

**Land transport ADR/RID (cross-border)**

**ADR/RID class:** 5.1 (O2) Oxidizing substances  
**UN-Number:** 1479  
**Packaging group:** I  
**Special marking:** Symbol (fish and tree)  
**UN proper shipping name:** 1479 OXIDIZING SOLID, N.O.S. (Silver nitrate)

**Maritime transport IMDG:**

**IMDG Class:** 5.1  
**UN Number:** 1479  
**Label:** 5.1  
**Packaging group:** I  
**Marine pollutant:** No  
**Proper shipping name:** OXIDIZING SOLID, N.O.S. (Silver nitrate)

**Air transport ICAO-TI and IATA-DGR:**

**ICAO/IATA Class:** 5.1  
**UN/ID Number:** 1479  
**Label:** 5.1  
**Packaging group:** I  
**Proper shipping name:** OXIDIZING SOLID, N.O.S. (Silver nitrate)

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**UN "Model Regulation":** UN1479, OXIDIZING SOLID, N.O.S., 5.1, I  
**Environmental hazards:** Environmentally hazardous substance, solid; Marine Pollutant  
**Special precautions for user** Warning: Oxidizing substances  
**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.

**15 Regulatory information**

**Safety, health and environmental regulations/legislation specific for the substance or mixture**

**Product related hazard informations:**

The product has been classified and marked in accordance with directives on hazardous materials.

**Hazard symbols:**

C Corrosive  
 O Oxidizing  
 N Dangerous for the environment

**Risk phrases:**

8 Contact with combustible material may cause fire.  
 34 Causes burns.  
 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

**Safety phrases:**

26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.  
 45 In case of accident or if you feel unwell, seek medical advice immediately.  
 60 This material and its container must be disposed of as hazardous waste.  
 61 Avoid release to the environment. Refer to special instructions/Safety data sheets

**National regulations**

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.  
 All components of this product are listed on the Canadian Domestic Substances List (DSL).

**Information about limitation of use:**

For use only by technically qualified individuals.  
 This product contains silver and is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

**Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

**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.

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing MSDS:** Health, Safety and Environmental Department.

**Contact:**

Zachariah C. Holt  
 Global EHS Manager

**Reference Sources:**

CRC Handbook of Chemistry and Physics  
 CRC Press

Hawley's Condensed Chemical Dictionary  
 Van Nostrand Reinhold, New York

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National Institute for Occupational Safety and Health  
Registry of Toxic Effects of Chemical Substances  
U. S. Government Printing Office, Washington D. C.

Richard J. Lewis, Sr.  
Sax's Dangerous Properties of Industrial Materials  
Van Nostrand Reinhold, New York

The Merck Index  
Merck & Co., Inc., Rahway N. J.

L. Bretherick  
Handbook of Chemical Hazards  
Butterworths

L. Roth, U. Weller  
Gefährliche chemische Reaktionen  
ecomed verlag, Landsberg

**Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)  
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)  
IMDG: International Maritime Code for Dangerous Goods  
DOT: US Department of Transportation  
IATA: International Air Transport Association  
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)  
ICAO: International Civil Aviation Organization  
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)  
EINECS: European Inventory of Existing Commercial Chemical Substances  
CAS: Chemical Abstracts Service (division of the American Chemical Society)  
HMIS: Hazardous Materials Identification System (USA)  
WHMIS: Workplace Hazardous Materials Information System (Canada)  
LC50: Lethal concentration, 50 percent  
LD50: Lethal dose, 50 percent

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