

Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 05/14/2010

Reviewed on 05/13/2010

1 Identification of substance:**Product details:****Product name:** Silver nitrate**Stock number:** 11414**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 information:**

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

2 Composition/Data on components:**Chemical characterization:****Description: (CAS#)**

Silver nitrate (CAS# 7761-88-8)

Identification number(s):**EINECS Number:** 231-853-9**Index number:** 047-001-00-2**3 Hazards identification****Hazard description:**

C Corrosive
 O Oxidizing
 N Dangerous for the environment

Information pertaining to particular dangers for man and environment

R 8 Contact with combustible material may cause fire.

R 34 Causes burns.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Classification system**HMIS ratings (scale 0-4)****(Hazardous Materials Identification System)**

HEALTH	2
FIRE	0
REACTIVITY	2

Health (acute effects) = 2

Flammability = 0

Reactivity = 2

GHS label elements**Danger**

2.14/2 - May intensify fire; oxidizer.

**Danger**

3.2/1B - Causes severe skin burns and eye damage.

**Warning**

4.1/1 - Very toxic to aquatic life.

4.1/1 - Very toxic to aquatic life with long lasting effects.

Prevention:

Wear protective gloves/protective clothing/eye protection/face protection.

Avoid release to the environment.

Response:

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

(Contd. on page 2)

- USA

Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 05/14/2010

Reviewed on 05/13/2010

Product name: Silver nitrate

(Contd. of page 1)

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Immediately call a POISON CENTER or doctor/physician.

Disposal:

Dispose of contents/container in accordance with local/regional/national/international regulations.

4 First aid measures

General information Immediately remove any clothing soiled by the product.

After inhalation

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

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

After swallowing Seek immediate medical advice.

5 Fire fighting measures**Suitable extinguishing agents**

Use carbon dioxide, extinguishing powder or foam. Water may be ineffective but may be used for cooling exposed containers.

Special hazards caused by the material, its products of combustion or resulting gases:

In case of fire, the following can be released:

Metal oxide fume

Nitrogen oxides (NOx)

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

Protective equipment:

Wear self-contained respirator.

Wear fully protective impervious suit.

6 Accidental release measures**Person-related safety precautions:**

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

Measures for environmental protection:

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

Measures for cleaning/collecting:

Use neutralizing agent.

Dispose contaminated material as waste according to item 13.

Ensure adequate ventilation.

Additional information:

See Section 7 for information on safe handling

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

7 Handling and storage**Handling****Information for safe handling:**

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:

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.

Storage

Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility:

Store away from flammable substances.

Store away from reducing agents.

Store in the dark.

Further information about storage conditions:

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

(Contd. on page 3)

USA

Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 05/14/2010

Reviewed on 05/13/2010

Product name: Silver nitrate

(Contd. of page 2)

Protect from exposure to light.

8 Exposure controls and 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.

Components with limit values that require monitoring at the workplace:

Silver, soluble compounds, as Ag

mg/m³

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

Additional information: No data**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

Full face protection

Body protection: Protective work clothing.

9 Physical and chemical properties:**General Information**

Form:	Crystalline
Color:	White
Odor:	Odorless

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.

Ignition temperature: Not determined

Decomposition temperature: Not determined

(Contd. on page 4)

USA

Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 05/14/2010

Reviewed on 05/13/2010

Product name: Silver nitrate

(Contd. of page 3)

Explosion limits:

Lower: Not determined
Upper: Not determined

Vapor pressure: Not determined

Density at 20°C (68°F): 4.352 g/cm³

**Solubility in / Miscibility with
 Water at 20°C (68°F):** 1173 g/l

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

Decomposition will not occur if used and stored according to specifications.

Materials to be avoided:

Light
 Reducing agents, easily oxidized materials
 Organic materials
 Metal powders

Dangerous reactions

Reacts with reducing agents
 Reacts with flammable substances
 Silver and silver salts may react with acetylenes to form shock sensitive compounds.

Dangerous products of decomposition:

Metal oxide fume
 Nitrogen oxides

11 Toxicological information**Acute toxicity:****LD/LC50 values that are relevant for classification:**

Oral	LD50	473 mg/kg (guinea pig)
		50 mg/kg (mouse)
		1173 mg/kg (rat)
	LDLo	20 mg/kg (dog)
Irritation of eyes	moderate	800 mg/kg (rabbit)
		10 mg (rabbit)
		severe

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):**

Tumorigenic effects have been observed in tests with laboratory animals at very high doses
 Reproductive effects have been observed on tests with laboratory animals.

Subacute to chronic toxicity:

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. 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.

Subacute to chronic toxicity:

The Registry of Toxic Effects of Chemical Substances (RTECS) reports the following effects in laboratory animals:

Behavioral - tetany.

Behavioral - somnolence (general depressed activity).

Behavioral - food intake (animal).

Lungs, Thorax, or Respiration - cyanosis.

Lungs, Thorax, or Respiration - dyspnea.

Gastrointestinal - hypermotility, diarrhea.

Cardiac - other changes.

Cardiac - pulse rate increase, without fall in BP.

Cardiac - cardiomegaly.

Related to Chronic Data - death.

Liver - other changes.

Liver - hepatitis (hepatocellular necrosis), diffuse

Kidney, Ureter, Bladder - changes in tubules (including acute renal failure, acute tubular necrosis).

Kidney, Ureter, Bladder - interstitial nephritis.

(Contd. on page 5)

USA

Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 05/14/2010

Reviewed on 05/13/2010

Product name: Silver nitrate

(Contd. of page 4)

Kidney, Ureter, Bladder - urine volume increased.
 Blood - changes in erythrocyte (RBC) count.
 Nutritional and Gross Metabolic - weight loss or decreased weight gain.
 Skin and Appendages - tumors.
 Reproductive - Paternal Effects - spermatogenesis (including genetic material, sperm morphology, motility, and count).
 Reproductive - Paternal Effects - testes, epididymis, sperm duct.
 Reproductive - Fertility - male fertility index (e.g. # males impregnating females per # males exposed to fertile nonpregnant females)
 Tumorigenic - tumors at site of application.
 Tumorigenic - equivocal tumorigenic agent by RTECS criteria.

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:

Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.
 To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
 No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

12 Ecological information:**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.
 Danger to drinking water if even 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

13 Disposal considerations**Product:**

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

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: UN1493
Packing group: II
Proper shipping name (technical name): SILVER NITRATE
Label: 5.1
Remarks: Special marking with the symbol (fish and tree).

Land transport ADR/RID (cross-border)

ADR/RID class: 5.1 (O2) Oxidizing substances
Danger code (Kemler): 50

(Contd. on page 6)

USA

Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 05/14/2010

Reviewed on 05/13/2010

Product name: Silver nitrate

(Contd. of page 5)

UN-Number: 1493
Packaging group: II
Special marking: Symbol (fish and tree)
Description of goods: 1493 SILVER NITRATE

Maritime transport IMDG:

IMDG Class: 5.1
UN Number: 1493
Label: 5.1
Packaging group: II
Marine pollutant: Yes (P)
 Symbol (fish and tree)
Proper shipping name: SILVER NITRATE

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class: 5.1
UN/ID Number: 1493
Label: 5.1
Packaging group: II
Proper shipping name: SILVER NITRATE

UN "Model Regulation": UN1493, SILVER NITRATE, 5.1, II

Environmental hazards: Environmentally hazardous substance, solid; Marine Pollutant

15 Regulations**Product related hazard informations:****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.

16 Other information:

(Contd. on page 7)

USA

Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 05/14/2010

Reviewed on 05/13/2010

Product name: Silver nitrate

(Contd. of page 6)

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 Holt

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)

P: Marine Pollutant

GHS: Globally Harmonized 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)

HMIS: Hazardous Materials Identification System (USA)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

USA