Safety Data Sheet

Silver Nitrate

Created: May. 21, 2007
Revised: Nov. 01, 2016

1. Chemical Articles and Company Information

Name of Chemical Article:	Silver nitrate (I)
Company Name:	Toyo Chemical Industrial Co., Ltd.
Address:	2-26-13, Naka-Izumi, Komae-City, Tokyo
Tel.:	+81-3-3489-5152
Fax:	+81-3-3488-1706
Emergency Contact:	As above
Recommended Applications and Use Restrictions:	Silver plating, silver powder, antibacterial agents, mirrors, analytical test drugs, catalysts

2. Summary of Hazards

GHS Classification

Physicochemical hazards	Oxidizing solids	Class 2
Damage to health	Acute toxicity (oral)	Class 4
	Skin corrosiveness and irritation	Class 1
	Critical injury to eyes and eye irritation	Class 1
	Specific target organ toxicity (single exposure)	Class 3 (Respiratory tract irritation)
	Specific target organ toxicity (repeated exposure)	Class 1 (Respiratory system)
Damage to the environment	Aquatic environmental harm (acute hazard)	Class 1
	Aquatic environmental harm (long-term hazard)	Class 1

GHS Label Elements

Picture descriptions:

Cautionary terms: Danger

Hazard information:

Risk of fire accelerant: Oxidation substance
Harmful if ingested
Critical eye injury
Critical skin chemical burns
Risk of respiratory organ irritation
Respiratory system damage due to long-term or repeated exposure
Extremely strong poison to aquatic life
Extremely strong poison to aquatic life due to long-term effects

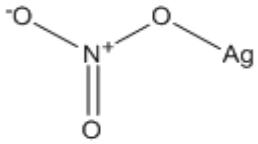
Cautions

Safety Measures:

Keep away from ignition sources such as heat, fireworks, naked flames, and high temperatures. No smoking.
Take preventive measures to avoid mixing with flammable.
When using the product, do not eat, drink, or smoke.
Use only outdoors or in a well-ventilated area.
Wear protective gloves, goggles, and face mask.
Do not breathe dust/fume/gas/mist/vapors/spray
Wash hands thoroughly after handling.
Avoid discharging into the environment.

Emergency Measures:	If the substance contacts the eye, irrigate with water thoroughly for several minutes. If contact lenses can be removed easily, remove and wash them. If eye irritation persists, consult a physician and receive treatment. If clothing is spattered, promptly remove and isolate all soiled clothing. Wash contaminated clothing before reuse. If the substance adheres to the skin, wash using copious amounts of water. If ingested, rinse out the mouth, and immediately consult a physician for treatment. If inhaled: Consult a physician promptly. If you feel unwell, consult a physician to receive diagnosis and treatment. Gather any leaks.
Storage:	Lock the storage location. Store in a well-ventilated place. Keep container tightly closed
Disposal:	If discarding contents or containers, entrust to a specialized waste disposal company.
Other hazards:	Not available

3. Composition and Component Information

Single Substance or Mixture:	Single Substance
Chemical name or general name:	Silver nitrate (I)
Another name:	-
Concentration or concentration range:	100%
Molecular formula (molecular weight):	$AgNO_3$ (169.87)
Chemical characteristics (rational or structural formula):	
CAS No.:	7761-88-8
Reference numbers in gazetted list in japan(CSCL and ISHL):	1-8
Impurities and stabilization additives that contribute to the classification:	No data

4. Emergency Measures

If inhaled:	Remove to fresh air. If symptoms persist, call a physician
Adhesion to skin:	If clothing is spattered, promptly remove and isolate all soiled clothing. Wash off immediately with soap and plenty of water. If symptoms persist, call a physician.
Contact with eyes:	Rinse cautiously with water for several minutes. Continue rinsing. Immediate medical attention is required.
If ingested:	Rinse mouth. If you feel unwell, consult a physician to receive diagnosis and treatment.
The most important sign of an acute symptom and the tardive symptom and symptom:	No information
Protection of people implementing emergency measures:	No information
Special precautions for physicians:	No information

5. Measures during Fires

Extinguishants:	Water jets, foam retardants, powder retardants (excluding hydrogen carbonate), dry sand, etc.
Extinguishants that must not be used:	Carbon gas, and hydrogen carbonate powder retardants
Characteristic dangers:	Thermal decomposition can lead to release of irritating and toxic gases and vapors. The fire extinguishing water might cause pollution.

Characteristic extinguishing methods:	Promptly move containers in the vicinity of the fire to a safe location. If moving is not possible, scatter water on the containers and their surroundings to cool.
Protection of firefighters:	Use personal protective equipment as required. Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

6. Measures during Leaks

Physical precautions, protective equipment, and measures during emergencies:	The worker wears a tool for appropriate protection (in item of "8. Exposure Avoidance and Protection Measures" reference) and avoids clothes, contact and inhalation to skin. Touch the leak thing and do not walk the inside. Cordon off the periphery of the dispersal area to prohibit the entrance of personnel.
Environmental precautions:	Avoid discharging into the environment.
Methods and materials for contamination and methods and materials for cleaning up:	No information
Collection and neutralization:	No information
Preventing secondary accidents:	No information

7. Handling and Storage Precautions

Handling

Technical measures:	Install local exhausters, and eye and hand washing facilities, in the handling locations. Ideally, handle in locations with local exhausters and overall ventilators. Wear protective gloves, goggles, and face mask.
Precautions for safe handling:	Do not handle until all safety precautions and readings are understood. When using the product, do not eat, drink, or smoke. Wash hands thoroughly after handling. Do not touch, inhale, or drink. Prevent contact with eyes, skin, and clothing. Avoid discharging into the environment.
Contact evasion:	In item of "10. Stability and Reactivity" reference.

Storage

Safe storage conditions:	Keep container protect from light, store in well-ventilated place at room temperature (preferably cool). Keep container tightly closed. Store locked up. Technical measures:No information
Container and packing materials:	Airtight containers (glass, polyethylene, stainless steel, etc.)

8. Exposure Avoidance and Protection Measures

Control concentration:	Unestablished
Tolerable concentration:	
Japan Society for Occupational Health (2015)	0.01mg/m^3 (as Ag)
ACGIH (2014)	TWA 0.1mg/m^3 (as Ag) TLV-TWA 0.01mg/m^3 (as Ag Soluble compounds) TLV-STEL Unestablished
Equipment measures:	Install local exhausters, and eye and hand washing facilities, in the handling locations.
Protective Equipment	
Respirator:	Poison masks (respirator during fires), and dust masks
Hand protective equipment:	Wear protective gloves. (Rubber gloves, etc.)
Eye protective equipment:	Wear eye protective equipment. (Goggles, etc.)
Skin and body protective equipment:	Wear protective face equipment, clothing, and protective shoes, etc. (Protective clothing, protective boots, etc.)

9. Physical and Chemical Properties

Physical properties

Shape:	Solid:ICSC(2004)
Color:	Colorless to white:ICSC(2004)
Odor:	No information

Odor threshold value:	No information
pH:	Weak acidity when dissolved in water
Melting point and coagulation point:	212℃ (melting point):GESTIS(2014)
Boiling point, initial boiling point, and boiling range:	440℃(Dissolves):HSDB(2014)
Ignition point:	No information
Vaporization speed (butyl acetate=1):	No information
Burnability (solids and gas):	No information
Explosion range:	No information
Vapor pressure:	No information
Vapor density (vapor=1):	5.86
Specific gravity (density):	No information
Solubility:	Water: 245g/100g、2160g/L(20℃):GESTIS(2014)
n-Octanol/water partition coefficient:	No information
Spontaneous ignition temperature:	No information
Dissolution temperature:	444℃:HSDB(2014)
Viscosity:	No information

10. Stability and Reactivity

Reactivity:	No information
Stability:	May be stable in storage according to laws and regulations and the handling.
Possibility of harmful reactions:	The chemical risk:The resolution happens when heated up. Toxic Hume such as nitrogen oxides occurs. Substance is an oxidant, and reacts with flammable substances and reducing substances. Reacted with an acetylene, alkali, halide, and much blend most moving passage danger compound. The danger of a fire and the explosion is posed. Plastic, rubber, a film agent are invaded.
Conditions to be avoided:	Light, heat, Flammable substances and reducing substances
Incompatible substances:	Flammable substances and reducing substances
Hazardous degradable organisms:	Silver and NO_X

11. Harmfulness Information

Acute toxicity	
Oral:	Rat : LD50; 1,173mg/kg(IUCLID (2000))
Pass; skin:	No data available
Inhalation:Gas	The definition of GHS is a solid.
Inhalation:Steam	The definition of GHS is a solid.
Inhalation:Dust,Mist	No data available
Skin corrosiveness and irritation:	When this material causes causticity for skin, there is a mention.(CICAD 44(2003)) And a chemical burn by the contact with skin is reported in occupation exposure.(ATSDR (1990))
Critical injury to eyes and eye irritation:	When this material causes severe causticity for eyes, there is a mention.(CICAD 44(2003)) And a chemical burn by the contact with eyes is reported in occupation exposure.(ATSDR (1990))
Respiratory organ sensitivity:	No data available
Skin sensitivity:	No data available
Germ-cell mutagenicity:	No data available
Carcinogenicity:	No data available
Reproductive toxicity:	No data available
Specific target organ toxicity (single exposure):	This material is corrosive, and there is respiratory tract acridity.(ATSDR (1990)、PATTY (6th, 2012)) In the Homo sapiens, buccal burning sensation and pain, driveling, vomiting, abdominal pain, diarrhea, severe gastroenteritis, a blood pressure drop, ventilatory frequency decrease, dizziness, convulsions, diaphragm muscular paralysis, a coma, a central nervous system obstacle, the death are reported as the stimulation of the respiratory tract mucous membrane, an oral acute intoxication symptom by mine dust inhalational exposure. (HSDB (Access on September 2014))There are not the data of the laboratory animal.

Specific target organ toxicity (repeated exposure):	There is a description that ten accused abdominal pain (reduced by antacid for an acute pain) for the stimulation symptom (sneezing, mucus, stuffy nose, pharynx stimulation ache) of the upper respiratory tract 25 of 30 workers done the exposure from under one year in silver nitrate and a manufacturing facility of silver oxide more than ten years by silver dust. (ATSDR (1990)、ACGIH (7th, 2001)) As for the abdominal pain, the possibility by the influence of the mucous membrane stimulation that ingested a part of the dust was thought about, and it was thought that you should not aim for the target organ without diarrhea, mention of other digestive organ symptoms including vomiting for few symptoms (1/3 of the whole) in question. The laboratory animal is the examination that water to drink gave this material 222 mg Ag/kg/day (349.6 mg/kg/day equivalency) to a rat for 37 weeks, and the increase of the death rate was seen 23 weeks later, but there is not the description of the organ toxicity other than a silver symptom of eyes. In addition, there are not the data available for a classification in laboratory animals.
Inhalable respiratory organ harmfulness:	No data available

12. Environmental Impact Information

Ecotoxicity

Aquatic environmental harm (acute hazard):	EC50: Daphnia magna 0.0006mg/L 48 h (collection of CERI hazard data, 2002)
Aquatic environmental harm (long-term hazard) :	It is a metal compound, and behavior in the water is unknown, and there are creature accumulation characteristics.
Hazard to the ozone layer :	The materials concerned are not listed by an affiliated book of Montreal Protocol.

13. Disposal Precautions:

Residual waste:	I handle detoxification, stabilization and the neutralization as much as possible and, before the disposal, do a level of the danger hazardousness in a low state. Obey the related laws and regulations, and local government standards for waste disposal. Entrust disposal to industrial waste disposal company or local public body that is authorized by the prefectural governor where available. If outsourcing waste disposal, thoroughly notify the disposal companies of the dangers and harmfulness before outsourcing.
Dirty containers and packaging:	Suitably process containers according to the relevant regulations and local government standards. When disposing of empty containers, make sure to discard the contents completely.

14. Shipping Precautions

International Regulations

UN No.:	1493
Proper Shipping Name:	Silver nitrate
Class:	5.1
Sub Risk:	-
Packing Group:	II
Marine pollutant (Sea):	Yes
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:	No

Japanese Regulations

Land Regulations Information:	Obey Poisonous and Deleterious Substances Control Law and Fire Services Act regulations.
Maritime Regulations Information:	Obey Ship Safety Law regulations.
Aviation Regulations Information:	Obey the Civil Aeronautics Law.
Special Safety Measures:	Yellow card display is required during transport.
Urgent Measures during a Crisis Policy Number:	140

15. Applicable Laws

Fire Service Act:	Class 1 hazardous material: Nitrates; Class 3 oxidizing solid (designated quantity: 1,000㎏)
Poisonous and Deleterious Substances Control Law:	Deleterious substance not for pharmaceutical use
Industrial Safety and Health Law:	Hazardous material (oxidizing substance) Notifiable substance (Article 57-2, government ordinance Article 18-2 attached table No. 9-137)
PRTR:	Class 1 designated chemical substance (attached table 1-82)
Regulations for the carriage and storage of dangerous goods in ship:	Oxidizing substance
Civil Aeronautics Act:	Oxidizing substance
Act on Port Regulations:	Oxidizing substance
Pharmaceutical Affairs Law:	Powerful drug, and designated drug

16. Other Information

Bibliography:

GHS classification results database: NITE website
GHS model SDS information: JISHA website
Reagent guidebook (Revised 2003)
Collection of Poisonous Materials Standard Notifications
Dictionary of Chemistry (1987 30th printing: Kyoritsu Shuppan)
16112 Chemical Products (2012 The Chemical Daily)

*Caution:

Hazard and harmfulness evaluations were created using the data and information available at the current time, but is not necessarily thorough, so handle with care.

Further, the data and evaluations described herein are not in any way guaranteed. The descriptions refer to normal handling, so for special handling, first implement safety measures conforming to the new application and methods of use.

This SDS is translated into English.(Original version is Japanese)