

# SAFETY DATA SHEET

Preparation Date: 04/21/2015

Revision Date: 04/21/2015

Revision Number: G1

**Product identifier**

**Product code:** S1090  
**Product Name:** SILVER OXIDE, POWDER, REAGENT

**Other means of identification**

**Synonyms:** Argentous oxide  
Disilver oxide  
Silver (I) oxide  
Silver(1+) oxide  
**CAS #:** 20667-12-3  
**RTECS #** VW4900000  
**CI#:** Not available

**Recommended use of the chemical and restrictions on use**

**Recommended use:** No information available.  
**Uses advised against** No information available

**Supplier:** Spectrum Chemicals and Laboratory Products, Inc.  
14422 South San Pedro St.  
Gardena, CA 90248  
(310) 516-8000

**Order Online At:** <https://www.spectrumchemical.com>

**Emergency telephone number** Chemtrec 1-800-424-9300  
**Contact Person:** Martin LaBenz (West Coast)  
**Contact Person:** Ibad Tirmiz (East Coast)

## 2. HAZARDS IDENTIFICATION

**Classification**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Oxidizing solids	Category 2

**Label elements**

## Danger

### Hazard statements

Causes skin irritation  
Causes serious eye irritation  
May intensify fire; oxidizer



### Hazards not otherwise classified (HNOC)

Not Applicable

### Other hazards

May be harmful if swallowed

### Precautionary Statements - Prevention

Wash face, hands and any exposed skin thoroughly after handling  
Keep away from heat/sparks/open flames/hot surfaces. — No smoking  
Keep/Store away from clothing/ .? /combustible materials  
Take any precaution to avoid mixing with combustibles .?  
Wear protective gloves  
Wear eye/face protection

### Precautionary Statements - Response

Specific treatment (see .? on this label)  
In case of fire: Use CO<sub>2</sub>, dry chemical, or foam to extinguish.  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.  
IF ON SKIN: Wash with plenty of soap and water  
If skin irritation occurs: Get medical advice/attention  
Take off contaminated clothing and wash before reuse

### Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %	Trade Secret
Silver Oxide 20667-12-3	20667-12-3	100	*

## 4. FIRST AID MEASURES

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### First aid measures

#### **General Advice:**

Poison information centers in each State capital city can provide additional assistance for scheduled poisons (13 1126). Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

#### **Skin Contact:**

Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention. If skin irritation persists, call a physician.

#### **Eye Contact:**

Flush eye with water for 15 minutes. Get medical attention.

#### **Inhalation:**

Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

#### **Ingestion:**

Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Obtain medical attention.

### **Most important symptoms and effects, both acute and delayed**

#### **Symptoms**

Causes serious eye irritation. Causes skin irritation. May be harmful if swallowed. Silver deposits on the conjunctiva or cornea of the eyes (Argyrosis). Argyria (blue-gray discoloration) of the mucous membranes of the upper respiratory tract from chronic inhalation. Localized Argyria from repeated skin contact.

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

#### **Notes to Physician:**

Treat symptomatically

### **Protection of first-aiders**

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste

## 5. FIRE-FIGHTING MEASURES

### Extinguishing Media

#### **Suitable Extinguishing Media:**

Water. CO2 may be of no value in extinguishing fires involving oxidizers and may only provide limited control.

#### **Unsuitable Extinguishing Media:**

Dry chemical. Halons. Foam.

### Specific hazards arising from the chemical

#### **Hazardous Combustion Products:**

Silver/ silver oxides, Oxygen

#### **Specific hazards:**

Oxidizer. Keep away from combustible materials (wood, paper, oil, clothing, etc.)  
The product is not flammable, but it may cause fire when in contact with other material  
Contact with combustible or organic materials may cause fire  
Will accelerate burning when involved in a fire  
Container explosion may occur under fire conditions or when heated

### Special Protective Actions for Firefighters

#### **Specific Methods:**

For large fires, flood fire area with water from a distance. Cool affected containers with flooding quantities of water. Do not get water inside containers. DO NOT use combustible materials such as sawdust.

**Special Protective Equipment for Firefighters:**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

**Personal Precautions:** Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid dust formation. Remove all sources of ignition. Keep combustibles (wood, paper, oil, clothing, etc.) away from spilled material.

**Environmental precautions** Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Prevent entry into waterways, sewers, basements or confined areas.

### Methods and material for containment and cleaning up

**Methods for containment** Stop leak if you can do it without risk. Cover with plastic sheet to prevent spreading.

**Methods for cleaning up** Sweep up and shovel into suitable containers for disposal. Do not use combustible materials such as paper towels, sawdust, clothing, etc. to clean up spill. Clean contaminated surface thoroughly.

## 7. HANDLING AND STORAGE

### Precautions for safe handling

**Technical Measures/Precautions:**

Provide sufficient air exchange and/or exhaust in work rooms. Avoid dust formation. Keep away from incompatible materials.

**Safe Handling Advice:**

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Do not breathe vapours/dust. Do not ingest. Keep away from combustible material. Handle in accordance with good industrial hygiene and safety practice.

### Conditions for safe storage, including any incompatibilities

**Technical Measures/Storage Conditions:**

Sensitive to light. Store in light-resistant containers. Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Do not store near combustible materials. Store in a segregated and approved area.

**Incompatible Materials:**

Reducing agents. Organic materials. Combustible materials. Metals. Ammonia. Amines. Strong bases. Strong acids. Hydrogen Sulfide. Hydrazine.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Control parameters

### **National occupational exposure limits**

**United States**

Components	OSHA	NIOSH	ACGIH	AIHA WHEEL
Silver Oxide - 20667-12-3	None	None	None	None

## Canada

Components	Alberta	British Columbia	Ontario	Quebec
Silver Oxide - 20667-12-3	None	0.01 mg/m <sup>3</sup> TWA (as Ag) 0.03 mg/m <sup>3</sup> STEL (as Ag)	None	None

## Australia and Mexico

Components	Australia	Mexico
Silver Oxide 20667-12-3	None	None

### Appropriate engineering controls

#### Engineering measures to reduce exposure:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

### Individual protection measures, such as personal protective equipment

#### Personal Protective Equipment

**Eye protection:** Goggles.

**Skin and body protection:** Chemical resistant apron. Long sleeved clothing. Gloves.

**Respiratory protection:** Wear respirator with dust filter..

**Hygiene measures:** Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

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<b>Physical state:</b> Solid.	<b>Appearance:</b> Powder.	<b>Color:</b> Dark grey. Dark brown. Black.
<b>Odor:</b> Odorless.	<b>Taste</b> No information available	<b>Molecular/Formula weight:</b> 231.74 g/mol
<b>Formula:</b> Ag <sub>2</sub> O	<b>Flash point (°C):</b> No data available	<b>Flashpoint (°C/°F):</b> No information available.
<b>Flash Point Tested according to:</b> Not available	<b>Lower Explosion Limit (%):</b> No information available	<b>Upper Explosion Limit (%):</b> No information available
<b>Autoignition Temperature (°C/°F):</b> No information available	<b>pH:</b> No information available	<b>Melting point/range(°C/°F):</b> No information available
<b>Boiling point/range(°C/°F):</b> No information available	<b>Decomposition temperature(°C/°F):</b> 300°C/ 572°F	<b>Bulk density:</b> No information available
<b>Specific gravity:</b> 7.22	<b>Vapor pressure @ 20°C (kPa):</b> No information available	<b>Density (g/cm<sup>3</sup>):</b> No information available
<b>Evaporation rate:</b> No information available	<b>Vapor density:</b> No information available	<b>VOC content (g/L):</b> No information available
<b>Odor threshold (ppm):</b> No information available	<b>Partition coefficient (n-octanol/water):</b> No information available	<b>Viscosity:</b> No information available
<b>Miscibility:</b> No information available	<b>Solubility:</b> Practically insoluble in water Solubility in water: 0.0017g/ 100 mL water @ 20°C	

## 10. STABILITY AND REACTIVITY

### Reactivity

Oxidizer. Reactive with metal powders, amines, ammonia, organic materials, reducing agents, ammonia, acids, reducing agents, strong bases, combustible materials, hydrazine, hydrogen sulfide

### Chemical stability

**Stability:** Sensitive to light. Exposure to light accelerates decomposition.

**Possibility of Hazardous Reactions:** Hazardous polymerization does not occur

**Conditions to avoid:** Exposure to light. Decomposes on exposure to light. Ignition sources. Incompatible materials. Contact with combustible materials (wood, paper, oil, clothing, etc.).

**Incompatible Materials:** Reducing agents. Organic materials. Combustible materials. Metals. Ammonia. Amines. Strong bases. Strong acids. Hydrogen Sulfide. Hydrazine.

**Hazardous decomposition products:** Oxygen. silver fumes.

### Other Information

**Corrosivity:** No information available

**Special Remarks on Corrosivity:** No information available

## 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

#### Principal Routes of Exposure:

Eyes. Ingestion. Inhalation. Skin.

### Acute Toxicity

#### Component Information

*Silver Oxide - 20667-12-3*

**LD50/oral/rat** = 2820 mg/kg Oral LD50 Rat

**LD50/oral/mouse** = 1027 mg/kg

**LD50/dermal/rabbit** = No information available

**LD50/dermal/rat** = No information available

**LC50/inhalation/rat** = No information available

**LC50/inhalation/mouse** = No information available

**Other LD50 or LC50 information** = No information available

#### Product Information

**LD50/oral/rat** =

**VALUE- Acute Tox Oral** = 2820mg/kg

**LD50/oral/mouse** =

**Value - Acute Tox Oral** = 1027mg/kg

**LD50/dermal/rabbit**

**VALUE-Acute Tox Dermal** = No information available

**LD50/dermal/rat**

**VALUE -Acute Tox Dermal** = No information available

**LC50/inhalation/rat**

**VALUE-Vapor** = No information available

**VALUE-Gas** = No information available

**VALUE-Dust/Mist** = No information available

**LC50/Inhalation/mouse**

**VALUE-Vapor** = No information available

**VALUE - Gas** = No information available

**VALUE - Dust/Mist** = No information available

### Symptoms

**Skin Contact:** May cause skin irritation.

**Eye Contact:** Causes serious eye irritation.

**Inhalation** May cause irritation of the respiratory tract and mucous membranes irritation.  
**Ingestion** May be harmful if swallowed. Causes digestive (gastrointestinal) tract irritation. May cause abdominal pain. May cause diarrhea. It may affect behavior/central nervous system (tetany, convulsions).

**Aspiration hazard** No information available

## Delayed and immediate effects as well as chronic effects from short and long-term exposure

**Chronic Toxicity** Prolonged or repeated exposure to Silver (I) oxide dust may result in silver deposits on the conjunctiva or cornea of the eyes (ocular Argyrosis). Chronic inhalation silver oxide dust may cause argyria of the mucous membranes of the upper respiratory tract, which is characterized by a permanent blue-gray discoloration of the mucous membranes. Repeated or prolonged inhalation may cause staining of the alveoli and bronchial tissue and internal nasal septum pigmentation. However, generalized Argyria or pigmentation of skin or other external mucous membranes is not likely or expected. Since Silver (I) oxide is a practically insoluble silver compound and not readily taken up by the body, prolonged or repeated ingestion is not expected or likely to cause generalized Argyria, the development of a characteristic, irreversible (permanent) bluish-gray or ash-gray pigmentation of the skin. However, skin contact may cause localized Argyria.

**Sensitization:** No information available

**Mutagenic Effects:** No information available

**Carcinogenic effects:** Not considered carcinogenic

Components	ACGIH - Carcinogens	IARC	NTP	OSHA HCS - Carcinogens	Australia - Prohibited Carcinogenic Substances	Australia - Notifiable Carcinogenic Substances
Silver Oxide	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

**Reproductive toxicity** No data is available

**Reproductive Effects:** No information available  
**Developmental Effects:** No information available  
**Teratogenic Effects:** No information available

### **Specific Target Organ Toxicity**

**STOT - single exposure** No information available  
**STOT - repeated exposure** No information available  
**Target Organs:** No information available

## **12. ECOLOGICAL INFORMATION**

### **Ecotoxicity**

**Ecotoxicity effects:** Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Persistence and degradability:** No information available

**Bioaccumulative potential:** No information available

**Mobility:** No information available

### 13. DISPOSAL CONSIDERATIONS

#### Disposal Methods

**Waste from residues / unused products:**

Waste must be disposed of in accordance with Federal, State and Local regulation.

**Contaminated packaging:**

Empty containers should be taken for local recycling, recovery or waste disposal

Components	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Silver Oxide	None	None	None	None

### 14. TRANSPORT INFORMATION

**DOT**

**UN-No:** UN1479  
**Proper Shipping Name:** Oxidizing solid, n.o.s. (silver oxide)  
**Hazard Class:** 5.1  
**Subsidiary Risk:**  
**Packing Group:** II  
**ERG No:** 140  
**Marine Pollutant:** No data available  
**DOT RQ (lbs):** No information available  
**Symbol(s):** G

**TDG (Canada)**

**UN-No:** UN1479  
**Proper Shipping Name:** Oxidizing solid, n.o.s.  
**Hazard Class:** 5.1  
**Subsidiary Risk:** No information available  
**Packing Group:** II  
**Description:** No information available

**ADR**

**UN-No:** UN1479  
**Proper Shipping Name:** Oxidizing solid, n.o.s.  
**Hazard Class:** 5.1  
**Packing Group:** II  
**Subsidiary Risk:** No information available  
**Classification Code:** No information available  
**Description:** No information available  
**CEFIC Tremcard No:** No information available

**IMO / IMDG**

**UN-No:** UN1479  
**Proper Shipping Name:** Oxidizing solid, n.o.s.  
**Hazard Class:** 5.1  
**Subsidiary Risk:** No information available  
**Packing Group:** II  
**Description:** No information available  
**IMDG Page:** No information available  
**Marine Pollutant:** No information available  
**EMS:** F-A

## 14. TRANSPORT INFORMATION

**MFAG:** No information available  
**Maximum Quantity:** No information available

### RID

**UN-No:** UN1479  
**Proper Shipping Name:** Oxidizing solid, n.o.s.  
**Hazard Class:** 5.1  
**Subsidiary Risk:** No information available  
**Packing Group:** II  
**Classification Code:** No information available  
**Description:** No information available

### ICAO

**UN-No:** UN1479  
**Proper Shipping Name:** Oxidizing solid, n.o.s.  
**Hazard Class:** 5.1  
**Subsidiary Risk:** No information available  
**Packing Group:** II  
**Description:** No information available

### IATA

**UN-No:** UN1479  
**Proper Shipping Name:** Oxidizing solid, n.o.s.  
**Hazard Class:** 5.1  
**Subsidiary Risk:** No information available  
**Packing Group:** II  
**ERG Code:** 5L  
**Description:** No information available

## 15. REGULATORY INFORMATION

### International Inventories

Components	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
Silver Oxide	Present	Present KE-12270	Present	Present (1)-9	Present	Present	Present 243-957-1

### U.S. Regulations

#### Silver Oxide

**New Jersey RTK Hazardous Substance List:** sn 3008 (listed as "Silver compounds")

**New Jersey (EHS) List:** SN 3008 TPQ: 500 lb. (Category code N740. Includes any unique chemical substance that contains Silver as part of that chemical's infrastructure)

**New Jersey - Discharge Prevention - List of Hazardous Substances:** Present (listed as "Silver compounds")

**Pennsylvania RTK - Environmental Hazard List** Present (listed as "Silver compounds")

**California Directors List of Hazardous Substances:** Present (listed as "Silver compounds")

### California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

#### Chemicals Known to the State of California to Cause Cancer:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

#### Chemicals Known to the State of California to Cause Reproductive Toxicity:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Components	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Silver Oxide	Not Listed	Not Listed	Not Listed	Not Listed

**CERCLA/SARA**

Components	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting <i>de minimis</i>
Silver Oxide	None	None	None	Silver compounds	1%

**U.S. TSCA**

Components	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Silver Oxide	Not Applicable	Not Applicable

**Canada****WHMIS hazard class:**

C Oxidizing materials  
D2B Toxic materials

**Canada Controlled Products Regulation:**

This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

**Inventory**

Components	Canada (DSL)	Canada (NDSL)
Silver Oxide	Present	Not Listed

Components	CEPA Schedule I - Toxic Substances	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
Silver Oxide	Not listed	Not listed

**EU Classification**

R36/38 - Irritating to eyes and skin.

**S -phrase(s)**

none

Components	Classification	Concentration Limits:	Safety Phrases
Silver Oxide		No information	

The product is classified in accordance with Annex VI to Directive 67/548/EEC

**Indication of danger:**

Xi - Irritant.  
O - Oxidising.



## 16. OTHER INFORMATION

**Preparation Date:** 04/21/2015  
**Revision Date:** 04/21/2015  
**Prepared by:** Sonia Owen

**Disclaimer:**

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

**End of Safety Data Sheet**