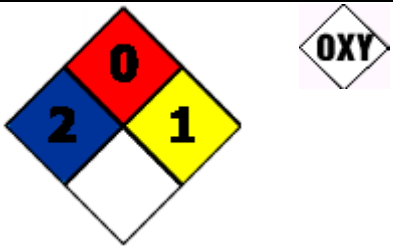
MATERIAL SAFETY DATA SHEET

NFPA	HMIS	Personal Protective Equipment
		

See Section 8.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product code:	S1881
Product Name:	SILVER (II) OXIDE
Chemical Name:	Silver oxide (AgO)
Synonyms:	Divasil Silver monooxide Silver monoxide Silver monoxide (AgO) Argentic oxide Silver peroxide Silver suboxide
Recommended use:	In the manufacture of silver oxide-zinc alkali batteries.
CAS #:	1301-96-8
Formula:	AgO
RTECS #	Not available
CI#:	Not available
Supplier:	Spectrum Chemicals and Laboratory Products, Inc. 14422 South San Pedro St. Gardena, CA 90248 (310) 516-8000
Emergency Telephone Number:	CHEMTREC: 1-800-424-9300
Contact Person:	Martin LaBenz (West Coast)
Contact Person:	Chris Terpak (East Coast)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER! OXIDIZER. Contact with combustible material may cause fire. WARNING! IRRITANT. Irritating to skin. Irritating to eyes. Irritating to respiratory system.

Odor:	**Physical state:**	**Appearance:**	**Color:**
None	Solid.	Powder.	Grey. Black. Charcoal-gray.

2. HAZARDS IDENTIFICATION

OSHA Regulatory Status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

POTENTIAL HEALTH EFFECTS

Principal Routes of Exposure:
Ingestion. Inhalation.

Acute Potential Health Effects:

Skin Contact:
Irritating to skin. May cause burns.

Eye Contact:
Moderately irritating to the eyes. May cause severe eye irritation and possible burns.

Inhalation:
Irritating to respiratory system.

Ingestion:
Causes digestive (gastrointestinal) tract irritation. May cause gastrointestinal (digestive) tract burns. May cause nausea and vomiting.

Chronic Potential Health Effects:

Target Organs: No information available.

Carcinogen Status: No information available

Mutagenic Effects: No information available

Teratogenic Effects: No information available

Aggravated Medical Conditions: No information available

See Section 11 for additional Toxicological Information

POTENTIAL ENVIRONMENTAL EFFECTS

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %
Silver (II) Oxide	1301-96-8	100

4. FIRST AID MEASURES

General Advice: Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126). First aider needs to protect himself. Ensure that medical personnel are aware of the material(s) involved and take precautons 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.

Notes to Physician: Treat symptomatically

5. FIRE-FIGHTING MEASURES

Flammable Properties

Flashpoint (°C/°F):	No information available.

Tested according to: Not applicable

Lower Explosion Limit (%):	No information available
Upper Explosion Limit (%):	No information available

Autoignition Temperature (°C/°F):	No information available

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. Foam. Halons.

Hazardous Combustion Products: Oxygen; silver fumes

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

Specific Methods: Water mist may be used to cool closed containers. For large fires, flood fire area with water from a distance. Apply water from as far a distance as possible. For fires involving tanks or car/trailer load, cool containers with flooding quantities of water until well after the fire is out. DO NOT use combustible materials such as sawdust.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:
Ensure adequate ventilation. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use personal protective equipment. Avoid contact with skin, eyes and 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.

Methods for Cleaning Up:
Use appropriate tools to put the spilled solid in a suitable waste disposal container. Shovel into suitable container 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

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. Keep away from combustible material. Do not breathe vapours/dust. Do not ingest. Handle in accordance with good industrial hygiene and safety practice.

Storage

Technical Measures/Storage Conditions:
Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Sensitive to light. Store in light-resistant containers. Store in a segrated and approved area. Do not store near combustible materials. Store away from incompatible materials.

Incompatible Products:
Reducing agents. Combustible materials. Organic materials.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure: Ensure adequate ventilation. 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.

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. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.

National occupational exposure limits

United States
U.S Occupational Exposure Limits: Not determined

Canada
Canada Occupational Exposure Limits:

Components	Alberta	British Columbia	Quebec	Ontario
Silver (II) Oxide 1301-96-8	Not determined	0.03 mg/m^3 STEL (as Ag) 0.01 TWA (as Ag)	Not determined	Not determined

Australia and Mexico

Occupational Exposure Limits for Australia and Mexico: Not determined

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:
Solid.

Appearance:
Powder.

Color:
Grey. Black. Charcoal-gray.

Odor:
None.

Taste
No information available

Molecular weight:
123.87

Flash point (°C):
Not determined

Lower Explosion Limit (%):
No information available

Upper Explosion Limit (%):
No information available

Autoignition Temperature (°C/°F):
No information available

pH:
No information available

Boiling point/range(°C/°F):
No information available

Melting point/range(°C/°F):
>100 °C/212 °F

Decomposition temperature(°C/°F):
>100 °C/212 °F

Specific gravity:
No information available

Density (g/cm3):
7.483 @ 25 °C

Bulk density:
No information available

Vapor pressure @ 20°C (kPa):
No information available

Vapor density:
No information available

Evaporation rate:
No information available

VOC content (g/L):
No information available

Odor threshold (ppm):
No information available

Partition coefficient (n-octanol/water):
No information available

Miscibility:
No information available

Solubility:
Insoluble in water
Soluble in alkalies and NH4OH (with decomposition and evolution of N2)

10. STABILITY AND REACTIVITY

Stability: Stable at normal conditions

Conditions to avoid: Heat. Avoid dust formation. Contact with combustible materials (wood, paper, oil, clothing, etc.). Exposure to light.

Materials to avoid: Reducing agents. Combustible material. Organic materials. Copper oxide. Ammonia. Antimony sulfide. Mercury sulfide. nitroalkanes. Hydrogen sulfide.

Hazardous decomposition products: Oxygen. silver fumes.

Possibility of Hazardous Reactions: Contact with combustible materials (wood, paper, oil, clothing, etc.) may cause fire
In dilute acids, oxygen is evolved immediately
In concentrated acid, intensely colored solutions are formed (brown in nitric acid and olive green in sulfuric acid)

Polymerization: Hazardous polymerisation does not occur

Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Component Information

Silver (II) Oxide - 1301-96-8

LD50/oral/rat = No information available
LD50/oral/mouse = No information available
LD50/dermal/rabbit = Not determined
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No infomaton available

Product Information

LC50/inhalation/rat = No information available
LC50/Inhalation/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = Not information available
LD50/oral/rat = No information available
LD50/oral/mouse = No information available

Local Effects

Skin irritation:	Irritating to skin. Moderate skin irritation. May cause burns.
Eye irritation:	Causes eye irritation. Moderate eye irritation. May cause burns.
Inhalation:	Irritating to respiratory system.
Ingestion:	Causes digestive (gastrointestinal) tract irritation. Ingestion may cause nausea, vomiting. May cause digestive (gastrointestinal) tract burns.
Sensitization:	No information available

Chronic Toxicity

Chronic Toxicity	Since Silver (II) oxide is an 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. Prolonged or repeated inhalation may cause bronchitis, emphysema and a reduction in pulmonary volume. 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. Prolonged or repeated exposure to Silver (II) oxide dust may result in siliver deposits on the conjunctiva or cornea of the eyes (ocular Argyrosis).
Carcinogenic effects:	Not considered carcinogenic
Mutagenic Effects:	No information available
Reproductive Effects:	No information available
Teratogenic Effects:	No information available
Target Organs:	No information available.

12. ECOLOGICAL INFORMATION

ECOTOXICITY

Toxicity to terrestrial and aquatic plants and animals: No information available

Ecotoxicity effects: No data available

Aquatic toxicity: No information available

Mobility: No information available

Persistence and degradability: No information available

Bioaccumulative potential: No information available

13. DISPOSAL CONSIDERATIONS

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 (II) 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
Packing Group: III
Subsidiary Risk: Not applicable
Marine Pollutant No data available
ERG No: 140
DOT RQ (lbs): No information available
Symbol(s): G

TDG (Canada)

Proper Shipping Name: Oxidizing solid, n.o.s. (silver oxide)
UN-No: UN1479
Hazard Class: 5.1
Packing Group: III
Subsidiary Risk: No information available
Description: No information available

ADR

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

IMO / IMDG

Proper Shipping Name:	Oxidizing solid, n.o.s. (silver oxide)
UN-No:	UN1479
Hazard Class:	5.1
Subsidiary Risk:	No information available
Packing Group:	III
Description:	No information available
IMDG Page:	No information available
Marine Pollutant	No information available
EMS:	F-A
MFAG:	No information available
Maximum Quantity:	No information available

RID

Proper Shipping Name:	Oxidizing solid, n.o.s. (silver oxide)
UN-No:	UN1479
Hazard Class:	5.1
Packing Group:	III
Subsidiary Risk:	5.1
Classification Code:	No information available
Description:	No information available

ICAO

UN-No:	UN1479
Hazard Class:	5.1
Proper Shipping Name:	Oxidizing solid, n.o.s. (silver oxide)
Packing Group:	III
Subsidiary Risk:	No information available
Description:	No information available

IATA

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

15. REGULATORY INFORMATION

International Inventories

Components	U.S. TSCA	Philippines (PICCS)	KOREA KECL	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
Silver (II) Oxide	Present	Not present	KE-31285	1-1018	Not present	Present	215-098-2

U.S. Regulations

Silver (II) Oxide

New Jersey RTK Hazard Substance: Listed as Silver compounds
New Jersey (EHS) List: Listed as Silver compounds
New Jersey - Discharge Prevention - List of Hazardous Substances Listed as Silver compounds
Pennsylvania RTK: Listed as Silver compounds
Pennsylvania RTK - Environmental Hazard List Listed as Silver compounds
Michigan - Critical Materials List: Listed as Silver compounds
California Directors List of Hazardous Substances: Listed as silver compounds

California Prop. 65: Safe Drinking Water and Toxic Enforcment 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 (II) 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 *de minimis*
Silver (II) Oxide	None	None	None	Silver compounds	1.0

U.S. TSCA

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

EU Classification

R -phrase(s)
R 8 - Contact with combustible material may cause fire.
R36/37/38 - Irritating to eyes, respiratory system and skin.

S -phrase(s)
S17 - Keep away from combustible material.
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37 - Wear suitable gloves.

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

Indication of danger:
Xi - Irritant.
O - Oxidising.

16. OTHER INFORMATION

The MSDS format complies with ANSI Z400.1-2004 standards.

Preparation Date 11-Oct-2010

Reason for revision: Not applicable

Prepared by: Sonia Owen

Literature reference: No information available

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) 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 MSDS. The physical properties reported in this MSDS 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 MSDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.