SAFETY DATA SHEET

Preparation Date: 07/21/2015 **Revision date** 11/12/2019 **Revision Number:** G2

1. IDENTIFICATION

Product identifier

Product code: S1060
Product Name: SILVER CYANIDE, POWDER, PURIFIED

Other means of identification
Synonyms: Cyanure d'argent [French]
Kyanid stribrny [Czech]
Silver cyanide (Ag(CN))
Silver(1+) cyanide
CAS #: 506-64-9
RTECS # VW3850000
CI#: Not available

Recommended use of the chemical and restrictions on use
Recommended use: In silver plating. Electroplating agent.
Uses advised against No information available

Supplier:
Spectrum Chemical Mfg. Corp
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: Tom Tyner (USA - West Coast)
Contact Person: Ibad Tirmiz (USA - East Coast)

2. HAZARDS IDENTIFICATION

Classification

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

Considered a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Acute toxicity - Oral	Category 2
Acute toxicity - Dermal	Category 1
Acute toxicity - Inhalation (Dusts/Mists)	Category 2
Serious eye damage/eye irritation	Category 2A

Label elements

Danger

Hazard statements
Fatal if swallowed, in contact with skin or if inhaled
Causes serious eye irritation

Hazards not otherwise classified (HNOC)
Not Applicable

Other hazards
Contact with acids liberates very toxic gas

Precautionary Statements - Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Do not get in eyes, on skin, or on clothing
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe dust
Use only outdoors or in a well-ventilated area
Wear respiratory protection

Precautionary Statements - Response

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 attention.
IF ON SKIN: Gently wash with plenty of soap and water
Immediately call a POISON CENTER or physician
Take off immediately all contaminated clothing
Wash contaminated clothing before reuse
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or physician.
IF SWALLOWED: Immediately call a POISON CENTER or physician
Rinse mouth

Precautionary Statements - Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal
Dispose of contents and container to an approved waste disposal plant in accordance with local, regional, national and international regulations as applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS No	Weight-%
Silver Cyanide	506-64-9	100

4. FIRST AID MEASURES

First aid measures

General Advice: National Capital Poison Center in the United States can provide assistance if you have a poison emergency and need to talk to a poison specialist. Call 1-800-222-1222. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. First aider needs to protect himself.

Skin Contact: Fatal in contact with skin. Wash off immediately with soap and plenty of water. Continue flushing with plenty of water for at least 15 minutes. Remove all contaminated clothes and shoes. Immediate medical attention is required. Call a physician or poison control center immediately.

Eye Contact: Flush eyes with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.

Inhalation: Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. WARNING! It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required.

Ingestion: Fatal if swallowed. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Immediate medical attention is required.

Most important symptoms and effects, both acute and delayed

Symptoms

Causes serious eye irritation
It may be absorbed through the skin
May cause respiratory irritation
Nose and throat irritation
Coughing and wheezing
Dyspnea (Shortness of breath and difficulty breathing)
May cause nausea and headache
Dizziness
Severe over-exposure can result in death
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: Antidote: Always have a Cyanide Antidote Kit (Package) when working with cyanide compounds. Get medical advice on how to use it and when it should be used. If cyanide gas is inhaled, break an Amyl nitrate pearl in a cloth and hold it lightly under the nose for 15 seconds. Repeat 5 times at about 15 second intervals. Use artificial respiration if breathing has stopped. If cyanide is swallowed, use Amyl nitrate as previously stated for 15 seconds. Nithidote Kit or Hydroxocobalamin (Cyanokit) are alternate approved treatments. Oxygen therapy may be useful in combination with the above.

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: If it is involved in a fire, extinguish the fire using an agent suitable for the type of surrounding fire. The product itself does not burn.

Unsuitable Extinguishing Media: No information available.

Specific hazards arising from the chemical

Hazardous combustion products — Carbon monoxide. Carbon dioxide (CO2). Nitrogen oxides (NOx). Hydrogen cyanide. Metallic oxides.

Specific hazards — Toxic gases and vapors may be released when cyanide decomposes. Contact with acid released hydrogen cyanide gas. Containers may explode when heated. Flammable in presence of oxidizing material. Slightly explosive to explosive in presence of oxidizing material.

Special Protective Actions for Firefighters

Specific Methods: — No information available

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: Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Evacuate personnel to safe areas. Avoid breathing dust. Avoid dust formation. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

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 powder spill with plastic sheet or tarp to minimize spreading.

Methods for cleaning up — Use appropriate tools to put the spilled solid in a suitable waste disposal container. 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 dust. Do not ingest. Do not smoke. Keep away from open flames, hot surfaces and sources of ignition.

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. Do not store near acids. Store away from incompatible materials. Store in a segregated and approved area.

Incompatible Materials:
Acetylene
Ammonia
Hydrogen peroxide
Strong acids
Oxidizing agents
Copper
Phosphorus tricyanide

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

Component	CAS No	OSHA	NIOSH	ACGIH	AIHA WEEL
Silver Cyanide	506-64-9	None	None	None	None

Canada

Component	CAS No	Canada - Alberta	Canada - British Columbia	Canada - Ontario	Canada - Quebec
Silver Cyanide	506-64-9	None	None	None	None

Australia and Mexico

Component	CAS No	Australia	Mexico
Silver Cyanide	506-64-9	None	None

Appropriate engineering controls

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.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

Eye protection: Safety glasses with side-shields. or Goggles

Skin and body protection: Chemical resistant protective suit
Gloves
Boots

Respiratory protection: Wear respirator with dust filter. Be sure to use an approved/certified respirator or equivalent.

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

Physical state: Solid	**Appearance:** Powder.	**Color:** Grayish White.
Odor: Odorless.	**Taste** Tasteless.	**Formula** AgCN
Molecular/Formula weight (g/mole): 133.90	**Flammability (solid, gas)** no data available	**Flashpoint (°C/°F):** No information available
Flash Point Tested according to: Not available	**Autoignition Temperature (°C/°F):** No information available	**Lower Explosion Limit (%):** No information available
Upper Explosion Limit (%): No information available	**Melting point/range(°C/°F):** 320°C/ 608°F	**Decomposition temperature(°C/°F):** No information available
Boiling point/range(°C/°F): No information available	**Bulk density:** No information available	**Density (g/cm3):** No information available
Specific gravity: 3.95	**pH** No information available	**Vapor pressure @ 20°C (kPa):** No information available
Evaporation rate: No information available	**Vapor density:** No information available	**VOC content (g/L):** No information available
Odor threshold (ppm): No information available	**Partition coefficient (n-octanol/water):** No information available	**Viscosity:** No information available
Miscibility: No information available	**Solubility:** Very slightly soluble in cold water	

10. STABILITY AND REACTIVITY

Reactivity

Contact with acids and acid salts causes immediate formation of toxic and flammable hydrogen cyanide gas
Fusion of mixtures of metal cyanides with metal chlorates, perchlorates or nitrates causes a violent explosion
Converted by diluted hydrochloric acid and silver chloride. Fluorine and silver cyanide react with explosive violene at ordinary temperature. Hydrogen cyanide and mercury (II) cyanide: The cyanide is a friction- and impact-sensitive explosive and may initiate detonation of liquid hydrogen cyanide. Violent explosion occurs if cyanide salt is melted with nitrite salt. The melt explodes if cyanide plus chlorate or nitrite is heated to 450 deg. C. During vacuum sublimation of phosphorus tricyanid at ~ 100 deg C, explosions occurred.
Cyanide may react with carbon dioxide in air for form toxic hydrogen cyanide gas
Addition of cyanides to a molten nitrate bath (or vice versa) will result in an explosion.
Contact of metallic silver and sol silver cmpd with acetylene may cause formation of silver acetylide that is sensitive to shock.
Contact with ammonia may cause formation of cmpd that are explosive when dry. Contact with strong hydrogen peroxide solutions will cause violent decomp to oxygen gas

Chemical stability

Stability: Sensitive to light. Exposure to light accelerates decomposition. Stable under recommended storage conditions.

Possibility of Hazardous Reactions: Hazardous polymerization does not occur

Conditions to avoid: Heat. Ignition sources. Incompatible materials. Exposure to light.

Incompatible Materials:
Acetylene
Ammonia
Hydrogen peroxide
Strong acids

Oxidizing agents
Copper
Phosphorus tricyanide

Hazardous decomposition products: Carbon oxides. Hydrogen cyanide (hydrocyanic acid). Silver oxides.

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. Skin. Inhalation. Ingestion.

Acute Toxicity

The following values are calculated based on chapter 3.1 of the GHS document
Component Information

Silver Cyanide	
CAS No	506-64-9

LD50/oral/rat = = 123 mg/kg Oral LD50 Rat
LD50/oral/mouse = No information available
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 LC50information = No information available

Product Information

LD50/oral/rat =
Value - Acute Toxicity = 123 mg/kg

LD50/oral/mouse =
Value - Acute Tox = No information available

LD50/dermal/rabbit
Value - Acute Toxicity = No information available

LD50/dermal/rat
VALUE - Acute Tox = 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: Fatal if absorbed through skin. Causes skin irritation.

Eye Contact: Causes serious eye irritation.

Inhalation Fatal if inhaled. Can irritate the nose, throat and lungs causing coughing, wheezing, and/or shortness of breath.

Ingestion Fatal if swallowed. High exposures can cause headache, nausea, vomiting, dizziness, loss of consciousness and death.

Aspiration hazard No information available.

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

Chronic Toxicity Repeated exposure can cause a blue-grey discoloration of the skin, eyes, inner nose, mouth, throat, and internal body organs. This make take years to develop but is permanent. Repeated exposure can affect thyroid function and cause nosebleeds.

Sensitization: No information available.

Mutagenic Effects: No information available

Carcinogenic effects: Not considered carcinogenic.

Component	CAS No	IARC	ACGIH - Carcinogens	NTP	OSHA HCS - Carcinogens	Australia - Notifiable Carcinogenic Substances	Australia - Prohibited Carcinogenic Substances
Silver Cyanide	506-64-9	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

ACGIH (American Conference of Governmental Industrial Hygienists)

IARC (International Agency for Research on Cancer)

NTP (National Toxicology Program)

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

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 Thyroid.
Target Organs: Thyroid.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: No data available.

Persistence and degradability: No information available

Bioaccumulative potential: No information available.

Mobility in soil No information available
Other adverse effects 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

Component	CAS No	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Silver Cyanide	506-64-9	None	None	P104	None

14. TRANSPORT INFORMATION

DOT

UN-No:	UN1684
Proper Shipping Name:	Silver cyanide
Hazard Class	6.1
Subsidiary Class	No information available
Packing group:	II
Emergency Response Guide Number	151
Marine Pollutant	Marine Pollutant
DOT RQ (lbs):	No information available
Special Provisions	IB8, IP2, IP4, T3, TP33
Symbol(s):	[DOT]: (P) - Identifies a material that is a marine pollutant. [DOT]: (R1) - Identifies a material that is a hazardous substance that has a reportable quantity (RQ) of 1 pound (0.454 Kilograms).
Description:	UN1684, Silver cyanide, 6.1, II

TDG (Canada)

UN-No:	UN1684
Proper Shipping Name:	Silver cyanide
Hazard Class	6.1
Subsidiary Risk:	No information available
Packing Group:	II
Marine Pollutant	No Information available
Description:	UN1684, Silver cyanide, 6.1, II

ADR

UN Number	UN1684
Proper Shipping Name:	Silver cyanide

Transport hazard class(es) 6.1
Packing group II
Subsidiary Risk: No information available
Description: UN1684, Silver cyanide, 6.1, II

IMDG
UN-No: UN1684
Proper Shipping Name: Silver cyanide
Hazard Class: 6.1
Subsidiary Risk: P
Packing Group: II
Marine Pollutant No information available
EMS: F-A
Description UN1684, Silver cyanide, 6.1, II

RID
UN Number UN1684
Proper Shipping Name: Silver cyanide
Transport hazard class(es) 6.1
Subsidiary Risk: No information available
Packing group II
Description: UN1684, Silver cyanide, 6.1, II

ICAO (air)
UN-No: UN1684
Proper Shipping Name: Silver cyanide
Hazard Class 6.1
Subsidiary Risk: No information available
Packing Group: II
Description: UN1684, Silver cyanide, 6.1, II

IATA
UN Number UN1684
Proper Shipping Name: Silver cyanide
Transport hazard class(es) 6.1
Subsidiary Risk: No information available
Packing group II
Precautionary Statements - Response 6L
Special Provisions No information available
Description: UN1684, Silver cyanide, 6.1, II

15. REGULATORY INFORMATION

International Inventories

Component	CAS No	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	China IECSC	Australia (AICS)	EINECS-No.
Silver Cyanide	506-64-9	PresentACTIVE	Present KE-31271	Present	Present (1)-3	Present	Present	Present 208-048-6

U.S. Regulations

Silver Cyanide
Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: 1671
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard

Pennsylvania RTK - Environmental Hazard List Present
New York Release Reporting - List of Hazardous Substances:
1 lb RQ
Louisana Reportable Quantity List for Pollutants: Listed

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)

Component	CAS No	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Silver Cyanide	506-64-9	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Component	CAS No	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 Cyanide	506-64-9	1 lb final RQ 0.454 kg final RQ	None	None	None	None

U.S. TSCA

Component	CAS No	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Silver Cyanide	506-64-9	Not Applicable	Not Applicable

Canada

WHIMIS 2015 - GHS Classifications

WHMIS 2015 Hazard Classification Information: .

Component
Silver Cyanide
506-64-9 (100)

WHMIS 2015 Hazard Classification
Acute toxicity - Oral - Category 3: H301 Toxic if swallowed.; Acute toxicity - Inhalation - Category 1: H330 Fatal if inhaled. (releases a toxic gas upon contact with water (Hydrogen cyanide)); Skin corrosion/irritation - Category 2: H315 Causes skin irritation.; Serious Eye Damage/Eye Irritation - Category 1: H318 Causes serious eye damage.

Canada Hazardous Products Regulation This product has been classified according to the hazard criteria of the HPR (Hazardous Products Regulation) and the SDS contains all of the information required by the HPR

DSL/NDSL

Component	CAS No	Canada (DSL)	Canada (NDSL)
Silver Cyanide	506-64-9	Present	Not Listed

Component	CAS No	CEPA Schedule I - Toxic Substances
Silver Cyanide	506-64-9	Not listed

Component	CAS No	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
Silver Cyanide	506-64-9	Not listed

EU Classification

EU GHS - SV - CLP 1272/2008

Component	CAS No	EU GHS - SV - CLP (1272/2008)
Silver Cyanide	506-64-9	

EU - CLP (1272/2008)

R-phrase(s)
R36 - Irritating to eyes
R32 - Contact with acids liberates very toxic gas
R26/27/28 - Very toxic by inhalation, in contact with skin and if swallowed

S -phrase(s)
S 7 - Keep container tightly closed.
S 9 - Keep container in a well-ventilated place.
S36 - Wear suitable protective clothing
S38 - In case of insufficient ventilation, wear suitable respiratory equipment
S39 - Wear eye/face protection
S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)

Component	CAS No	**Classification**	**Concentration Limits:**	**Safety Phrases**
Silver Cyanide	506-64-9		No information	

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

Indication of danger:
Xi - Irritant
T+ - Very toxic

16. OTHER INFORMATION

Preparation Date: 07/21/2015
Revision date 11/12/2019
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

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End of Safety Data Sheet