

# Safety Data Sheet

Material Name: SELENIUM

SDS ID: 00226107

## \*\*\* Section 1 - PRODUCT AND COMPANY IDENTIFICATION \*\*\*

**Material Name:** SELENIUM

### Manufacturer Information

CMC Cometals  
CONTACT:  
2050 Center Avenue, Suite 250  
Ft. Lee, NJ 07024  
Mfg Contact: CMC Cometals

EMERGENCY

### Chemical Family

non-metallic

### Synonyms

SELENIUM ELEMENT; SELENIUM, METALLIC; SELENIUM METAL; SELENIUM, ELEMENTAL; Se; RTECS: VS7700000

## \*\*\* Section 2 - HAZARDS IDENTIFICATION \*\*\*

### EMERGENCY OVERVIEW

**Color:** red, gray or black

**Physical Form:** solid

**Odor:** odorless

**Health Hazards:** respiratory tract irritation, skin irritation, eye irritation

### POTENTIAL HEALTH EFFECTS

#### Inhalation

**Short Term:** irritation, nosebleed, lack of sense of smell, metal fume fever, headache, lung congestion

**Long Term:** irritation, nausea, vomiting, diarrhea, fatigue, emotional disturbances, kidney damage

#### Skin

**Short Term:** irritation

**Long Term:** irritation

#### Eye

**Short Term:** irritation (possibly severe)

**Long Term:** irritation

#### Ingestion

**Short Term:** nausea, vomiting, diarrhea

**Long Term:** same as effects reported in long term inhalation, skin disorders

## \*\*\* Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS \*\*\*

CAS	Component	Percent	Symbol(s)	Risk Phrase(s)
7782-49-2	SELENIUM	100	T	R:23/25-33-53
	231-957-4			

### Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Selenium inorganic compounds, Selenium compounds.

# Safety Data Sheet

Material Name: SELENIUM

SDS ID: 00226107

## \*\*\* Section 4 - FIRST AID MEASURES \*\*\*

### Inhalation

If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

### Skin

Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing before reuse. Destroy contaminated shoes.

### Eyes

Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

### Ingestion

If vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

### Note to Physicians

For inhalation, consider oxygen.

For ingestion, consider gastric lavage and catharsis. Consider oxygen.

## \*\*\* Section 5 - FIRE FIGHTING MEASURES \*\*\*

See Section 9 for Flammability Properties

**NFPA Ratings: Health: 2 Fire: 0 Reactivity: 0**

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

### Flammable Properties

Negligible fire hazard.

### Extinguishing Media

regular dry chemical, carbon dioxide, water, regular foam

Large fires: Use regular foam or flood with fine water spray.

### Fire Fighting Measures

Move container from fire area if it can be done without risk. Do not attempt to extinguish fire unless flow of material can be stopped first. Use extinguishing agents appropriate for surrounding fire. Flood with fine water spray. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Consider downwind evacuation if material is leaking.

## \*\*\* Section 6 - ACCIDENTAL RELEASE MEASURES \*\*\*

### Occupational spill/release

Do not touch spilled material. Stop leak if possible without personal risk. Small spills: Absorb with sand or other non-combustible material. Collect with absorbent into suitable container. Small dry spills: Collect spilled material in appropriate container for disposal. Move containers away from spill to a safe area. Large spills: Dike for later disposal. Keep unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

# Safety Data Sheet

Material Name: SELENIUM

SDS ID: 00226107

## \*\*\* Section 7 - HANDLING AND STORAGE \*\*\*

### Handling Procedures

Use methods to minimize dust.

### Storage Procedures

Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

## \*\*\* Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION \*\*\*

### Component Exposure Limits

#### SELENIUM (7782-49-2)

ACGIH: 0.2 mg/m<sup>3</sup> TWA

NIOSH: 0.2 mg/m<sup>3</sup> TWA

1 mg/m<sup>3</sup> IDLH

OSHA (US): 0.2 mg/m<sup>3</sup> TWA (as Se)

Mexico: 0.2 mg/m<sup>3</sup> TWA (as Se)

### IDLH

1 mg/m<sup>3</sup>

### Ventilation

Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

### PERSONAL PROTECTIVE EQUIPMENT

#### Eyes/Face

Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

#### Protective Clothing

Wear appropriate chemical resistant clothing.

#### Glove Recommendations

Wear appropriate chemical resistant gloves.

#### Respiratory Protection

The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

Measurement Element:

Selenium (Se)

1 mg/m<sup>3</sup>

Any quarter-mask respirator.

Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100 or P100.

Any air-purifying, full-facepiece respirator equipped with an N100, R100, or P100 filter.

Any powered, air-purifying respirator with a high-efficiency particulate filter.

Any supplied-air respirator.

Any self-contained breathing apparatus with a full facepiece.

Emergency or planned entry into unknown concentrations or IDLH conditions -

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

# Safety Data Sheet

Material Name: SELENIUM

SDS ID: 00226107

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Escape -

Any air-purifying, full-facepiece respirator equipped with an N100, R100, or P100 filter.

Any appropriate escape-type, self-contained breathing apparatus.

## \*\*\* Section 9 - PHYSICAL AND CHEMICAL PROPERTIES \*\*\*

<b>Physical State:</b>	Solid	<b>Appearance:</b>	Not available
<b>Color:</b>	red, gray or black	<b>Physical Form:</b>	solid
<b>Odor:</b>	odorless	<b>Odor Threshold:</b>	Not available
<b>Melting Point:</b>	217 °C	<b>Boiling Point:</b>	683 - 685 °C
<b>Vapor Pressure:</b>	10 mmHg @ 429 °C	<b>Vapor Density (air = 1):</b>	Not applicable
<b>Density:</b>	Not available	<b>Specific Gravity (water = 1):</b>	4.81
<b>Water Solubility:</b>	insoluble	<b>Coef. Water/Oil Dist:</b>	Not available
<b>Viscosity:</b>	221 cP @ 220 °C	<b>Molecular Weight:</b>	78.96
<b>Molecular Formula:</b>	Se		

### Solvent Solubility

**Soluble:** sulfuric acid, chloroform, methylene iodide, benzene, quinoline, nitric acid, ether, alkali solutions, selenium oxychloride

**Very Slightly Soluble:** carbon disulfide

**Insoluble:** alcohol

## \*\*\* Section 10 - STABILITY AND REACTIVITY \*\*\*

### Chemical Stability

Stable at normal temperatures and pressure.

### Conditions to Avoid

Avoid heat, flames, sparks and other sources of ignition. Avoid generating dust. Keep out of water supplies and sewers.

### Materials to Avoid

combustible materials, oxidizing materials, halogens, metals, metal carbide, metal salts, metal oxides, bases  
SELENIUM:

ALKALI METAL AMIDES: Produces explosive products.

ALKALINE EARTH METAL AMIDES: Produces explosive products.

BARIUM PEROXIDE: Ignites at 265 C.

BROMINE PENTAFLUORIDE: Violent reaction and possible ignition.

CADMIUM: Possible explosion when heated.

CHLORINE TRIFLUORIDE: Reacts violently, ignition often occurring.

CHROMIC ANHYDRIDE: Violent reaction.

FLUORINE: Ignites on contact.

LITHIUM SILICIDE: Incandescent reaction.

METAL ACETYLIDES: Incandescent reaction on heating.

METAL CARBIDES: Incandescent reaction on heating.

METAL CHLORATES (EXCEPT ALKALI): Incandescent reaction in the presence of water.

METALS: Contact of many metals with selenium results in incandescence.

# Safety Data Sheet

**Material Name: SELENIUM**

**SDS ID: 00226107**

NITROGEN TRICHLORIDE: Explodes on contact.  
ORGANIC MATERIALS + OXYGEN: May result in explosive oxidation.  
OXIDIZERS (STRONG): Fire and explosion hazard.  
PHOSPHORUS: Incandescent reaction when heated.  
POTASSIUM: Incandescence reaction with possible explosion.  
POTASSIUM BROMATE: Violent, explosive reaction.  
SILVER BROMATE: Violent explosive reaction.  
SILVER OXIDE: Ignition on grinding.  
SODIUM PEROXIDE: Forms explosive mixture.  
TIN (POWDERED): Extremely exothermic, incandescent reaction.  
ZINC: Possible explosion on heating.

## Decomposition Products

selenium  
Thermal decomposition products: selenium.

## Possibility of Hazardous Reactions

Will not polymerize.

## \* \* \* Section 11 - TOXICOLOGICAL INFORMATION \* \* \*

## Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

### **SELENIUM (7782-49-2)**

Oral LD50 Rat: 6700 mg/kg

## RTECS Acute Toxicity (selected)

The components of this material have been reviewed, and RTECS publishes the following endpoints:

### **SELENIUM (7782-49-2)**

Oral: 6700 mg/kg oral rat LD50

## Acute Toxicity Level

### **SELENIUM (7782-49-2)**

Slightly Toxic: ingestion.

## Component Carcinogenicity

### **SELENIUM (7782-49-2)**

IARC: Supplement 7 [1987]; Monograph 9 [1975] (Group 3 (not classifiable))

DFG: Category 3B (could be carcinogenic for man)

## RTECS Irritation

The components of this material have been reviewed and RTECS publishes no data as of the date on this document.

## Local Effects

### **SELENIUM (7782-49-2)**

Irritant: inhalation, skin, eye.

## Medical Conditions Aggravated by Exposure

gastrointestinal disorders, immune system disorders or allergies, kidney disorders, liver disorders, respiratory disorders, skin disorders and allergies

# Safety Data Sheet

Material Name: SELENIUM

SDS ID: 00226107

## RTECS Tumorigenic

The components of this material have been reviewed, and RTECS publishes the following endpoints:

### SELENIUM (7782-49-2)

480 mg/kg oral mouse TDLo (60 day(s))

## RTECS Reproductive Effects

The components of this material have been reviewed, and RTECS publishes the following endpoints:

### SELENIUM (7782-49-2)

134 mg/kg oral mouse TDLo (multigenerations)

## HEALTH EFFECTS

### Inhalation - Acute Exposure

SELENIUM: Inhalation may cause irritation of the upper respiratory tract with sneezing and coughing. Dust of metallic selenium may collect in the nostrils and produce catarrh, anosmia, and epistaxis. Exposure to selenium dust at air concentrations of 33 mg/m<sup>3</sup> for 8 hours resulted in death in 10% of the rats tested. The major pathologic finding was interstitial pneumonitis. A brief exposure to high concentrations of fume produced severe irritation of the nose and throat followed by headache in exposed workers. One case of transient dyspnea was reported. Large quantities of fume may produce pulmonary edema within 1 to 4 hours after exposure. Metal fume fever, an influenza-like illness, may occur due to the inhalation of freshly formed metal oxide particles sized below 1.5 microns and usually between 0.02-0.05 microns. Symptoms may be delayed 4-12 hours and begin with a sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms may include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude and a generalized feeling of malaise. Fever, chills, muscular pain, mild to severe headache, nausea, occasional vomiting, exaggerated mental activity, profuse sweating, excessive urination, diarrhea and prostration may also occur. Tolerance to fumes develops rapidly, but is quickly lost. All symptoms usually subside within 24-36 hours.

### Inhalation - Chronic Exposure

SELENIUM: Repeated or prolonged exposure has been reported to cause a metallic taste in the mouth, a garlic odor of the breath and sweat, bronchial and nasopharyngeal irritation, pallor, coated tongue, nervousness, depression, fatigue, vestibulotoxicity and gastrointestinal disturbances. Liver injury has been produced in experimental animals. Selenium compounds may affect the kidneys.

### Skin Contact - Acute Exposure

SELENIUM: Contact with dust or fumes may cause irritation.

### Skin Contact - Chronic Exposure

SELENIUM: Repeated or prolonged exposure may cause dermatitis.

### Eye Contact - Acute Exposure

SELENIUM: High concentrations of fume may cause severe irritation.

### Eye Contact - Chronic Exposure

SELENIUM: Repeated or prolonged exposure to irritants may cause conjunctivitis.

### Ingestion - Acute Exposure

SELENIUM: Elemental selenium is poorly absorbed from the gastrointestinal tract. Ingestion of selenium compounds may cause severe irritation and disturbances of the gastrointestinal tract and a metallic taste in the mouth.

### Ingestion - Chronic Exposure

SELENIUM: Repeated or prolonged ingestion may cause effects similar to those as detailed in chronic inhalation. In addition, symptoms may include partial loss of hair and nail changes. Additional data reported in animals includes anemia, liver, kidney and heart damage, sterility and congenital defects.

# Safety Data Sheet

Material Name: SELENIUM

SDS ID: 00226107

## \*\*\* Section 12 - ECOLOGICAL INFORMATION \*\*\*

### Component Analysis - Aquatic Toxicity

No LOLI ecotoxicity data are available for this product's components.

## \*\*\* Section 13 - DISPOSAL CONSIDERATIONS \*\*\*

### Disposal Methods

Dispose in accordance with all applicable regulations. Recycle if possible. Hazardous Waste Number(s): D010.

Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level.

Regulatory level- 1.0 mg/L.

### Component Waste Numbers

**SELENIUM (7782-49-2)**

RCRA: 1.0 mg/L regulatory level

## \*\*\* Section 14 - TRANSPORT INFORMATION \*\*\*

### US DOT Information

No Classification assigned.

### TDG Information

No Classification assigned.

### ADR Information

No Classification assigned.

### RID Information

No Classification assigned.

### IATA Information

No Classification assigned.

### ICAO Information

No Classification assigned.

### IMDG Information

No Classification assigned.

## \*\*\* Section 15 - REGULATORY INFORMATION \*\*\*

### U.S. Federal Regulations

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

#### **SELENIUM (7782-49-2)**

**SARA 313:** 1.0 % de minimis concentration

**CERCLA:** 100 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 45.4 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers)

### SARA Section 311/312 (40 CFR 370 Subparts B and C)

**Acute Health:** Yes **Chronic Health:** No **Fire:** No **Pressure:** No **Reactive:** No

# Safety Data Sheet

Material Name: SELENIUM

SDS ID: 00226107

## U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
SELENIUM (related to: Selenium compounds)	7782-49-2	Yes	Yes	Yes <sup>1</sup>	Yes	Yes	Yes

Not regulated under California Proposition 65

## Canada

### Canada WHMIS

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

**SELENIUM (7782-49-2)**

0.1 %

## Germany Water Classification

**SELENIUM (7782-49-2)**

Number 2751, hazard class 2 - hazard to waters

## EU Marking and Labelling

EC-No. 231-957-4

## Symbols

T Toxic

## Risk Phrases

**R23/25** Toxic by inhalation and if swallowed.

**R33** Danger of cumulative effects.

**R53** May cause long-term adverse effects in the aquatic environment.

## Safety Phrases

**S1/2** Keep locked-up and out of the reach of children. **S20/21** When using, do not eat, drink or smoke. **S28** After contact with skin, wash immediately with plenty of soap and water. **S45** In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). **S61** Avoid release to the environment. Refer to special instructions/Safety data sheets.

## Component Analysis - Inventory

Component	CAS	US	CA	EU	AU	PH	JP	KR	CN	NZ
SELENIUM	7782-49-2	Yes	DSL	EIN	Yes	Yes	No	Yes	Yes	Yes

# Safety Data Sheet

Material Name: SELENIUM

SDS ID: 00226107

## \*\*\* Section 16 - OTHER INFORMATION \*\*\*

### Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

### Full text of R phrases in Section 3

**R23/25** Toxic by inhalation and if swallowed.

**R33** Danger of cumulative effects.

**R53** May cause long-term adverse effects in the aquatic environment.

### Other Information

Reasonable care has been taken in the preparation of this information, but the manufacturer makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. **Disclaimer:** Supplier gives no warranty of merchantability or of fitness for a particular purpose. Any product purchased is sold on the assumption the purchaser will make his own tests to determine the quality and suitability of the product. Supplier expressly disclaims any and all liability for incidental and/or consequential property damage arising out of the use of this product. No information provided shall be deemed to be a recommendation to use any product in conflict with any existing patent rights. THIS MSDS IS TO BE UTILIZED SOLELY AS A REFERENCE DOCUMENT AND IT IS NOT TO BE USED TO SATISFY THE DISTRIBUTION REQUIREMENTS OF OSHA'S HAZARD COMMUNICATION STANDARD (HCS) NOR CANADA'S CONTROLLED PRODUCT REGULATION (CPR). Read the Material Safety Data Sheet before handling product.

### Copyright

©Copyright 1984-2009 ChemADVISOR, Inc. All rights reserved.

RTECS® is a United States trademark owned and licensed under authority of the U.S. Government, by and through Symyx Software Inc.

Portions ©Copyright 2001, U.S. Government. All rights reserved.

# Safety Data Sheet

Material Name: SELENIUM

SDS ID: 00226107

End of Sheet 00226107