

## SAFETY DATA SHEET

Version 4.9  
 Revision Date 11/13/2015  
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### 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Selenium

Product Number : 229865  
 Brand : Aldrich  
 Product Use : For laboratory research purposes.

Supplier : Sigma-Aldrich Canada Co.  
 2149 Winston Park Drive  
 OAKVILLE ON L6H 6J8  
 CANADA

Manufacturer : Sigma-Aldrich Corporation  
 3050 Spruce St.  
 St. Louis, Missouri 63103  
 USA

Telephone : +1 9058299500  
 Fax : +1 9058299292  
 Emergency Phone # (For both supplier and manufacturer) : +1-703-527-3887 (CHEMTREC)

Preparation Information : Sigma-Aldrich Corporation  
 Product Safety - Americas Region  
 1-800-521-8956

### 2. HAZARDS IDENTIFICATION

#### Emergency Overview

##### Target Organs

Central nervous system, Liver, Spleen., Gastrointestinal tract, Teeth.

##### WHMIS Classification

D1B	Toxic Material Causing Immediate and Serious Toxic Effects	Toxic by ingestion
D2B	Toxic Material Causing Other Toxic Effects	Toxic by inhalation. Chronic toxicity

##### GHS Classification

Acute toxicity, Oral (Category 3)  
 Acute toxicity, Inhalation (Category 3)  
 Specific target organ toxicity - repeated exposure (Category 2)  
 Chronic aquatic toxicity (Category 4)

##### GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H301 + H331	Toxic if swallowed or if inhaled
H373	May cause damage to organs through prolonged or repeated exposure.
H413	May cause long lasting harmful effects to aquatic life.

Precautionary statement(s)

P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P304 + P340 + P311	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/ physician.

**HMIS Classification**

Health hazard: 2  
Chronic Health Hazard: \*  
Flammability: 0  
Physical hazards: 0

**Potential Health Effects**

**Inhalation** Toxic if inhaled. May cause respiratory tract irritation.  
**Skin** May be harmful if absorbed through skin. May cause skin irritation.  
**Eyes** May cause eye irritation.  
**Ingestion** Toxic if swallowed.

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**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Formula : Se  
Molecular weight : 78.96 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
<b>Selenium</b>			
7782-49-2	231-957-4	034-001-00-2	<=100%

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**4. FIRST AID MEASURES****General advice**

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**If inhaled**

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**

Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

**In case of eye contact**

Flush eyes with water as a precaution.

**If swallowed**

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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**5. FIREFIGHTING MEASURES****Conditions of flammability**

Not flammable or combustible.

**Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**Special protective equipment for firefighters**

Wear self-contained breathing apparatus for firefighting if necessary.

**Hazardous combustion products**

Hazardous decomposition products formed under fire conditions. - Selenium/selenium oxides

**Explosion data - sensitivity to mechanical impact**

No data available

**Explosion data - sensitivity to static discharge**

No data available

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**6. ACCIDENTAL RELEASE MEASURES****Personal precautions**

Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

**Environmental precautions**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

### Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

## 7. HANDLING AND STORAGE

### Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed.

### Conditions for safe storage

Keep container tightly closed in a dry and well-ventilated place.

Store under inert gas. Keep in a dry place.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Basis
Selenium	7782-49-2	TWA	0.200000 mg/m3	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
Remarks	Occupational exposure limit is based on irritation effects and its adjustment to compensate for unusual work schedules is not required			
		TWA	0.100000 mg/m3	Canada. British Columbia OEL
		TWAEV	0.200000 mg/m3	Canada. Ontario OELs
		TWAEV	0.2 mg/m3	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
		TWAEV	0.200000 mg/m3	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
		TWA	0.2 mg/m3	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
	Occupational exposure limit is based on irritation effects and its adjustment to compensate for unusual work schedules is not required			
		TWA	0.1 mg/m3	Canada. British Columbia OEL
		TWA	0.2 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		TWA	0.200000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		TWA	0.2 mg/m3	USA. ACGIH Threshold Limit Values (TLV)

### Personal protective equipment

#### Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N99 (US) or type P2 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

### Hand protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

#### Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

#### Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374  
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

### Eye protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

### Skin and body protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

### Hygiene measures

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

### Specific engineering controls

Use mechanical exhaust or laboratory fumehood to avoid exposure.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Appearance

Form	powder
Colour	light grey

### Safety data

pH	No data available
Melting point/freezing point	Melting point/range: 217 °C (423 °F) - lit.
Boiling point	684.9 °C (1,264.8 °F) - lit.
Flash point	Not applicable
Ignition temperature	No data available
Auto-ignition temperature	No data available
Lower explosion limit	No data available
Upper explosion limit	No data available
Vapour pressure	No data available
Density	4.81 g/cm <sup>3</sup> at 25 °C (77 °F)
Water solubility	insoluble
Partition coefficient: n-octanol/water	log Pow: 5

Relative vapour density	No data available
Odour	No data available
Odour Threshold	No data available
Evaporation rate	No data available

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## 10. STABILITY AND REACTIVITY

### Chemical stability

Stable under recommended storage conditions.

### Possibility of hazardous reactions

No data available

### Conditions to avoid

No data available

### Materials to avoid

Strong oxidizing agents, Do not store near acids., Amides, Carbides, Metals, Nickel, Nitric acid, Nitrogen trichloride, Oxygen, Potassium, Zinc

### Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Selenium/selenium oxides  
Other decomposition products - No data available

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## 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

#### Oral LD50

LD50 Oral - Rat - 6,700 mg/kg

Remarks: Behavioral:Somnolence (general depressed activity). Lungs, Thorax, or Respiration:Dyspnea. Nutritional and Gross Metabolic:Changes in:Other changes.

#### Inhalation LC50

No data available

#### Dermal LD50

No data available

#### Other information on acute toxicity

No data available

### Skin corrosion/irritation

No data available

### Serious eye damage/eye irritation

No data available

### Respiratory or skin sensitisation

No data available

### Germ cell mutagenicity

No data available

### Carcinogenicity

Carcinogenicity - Mouse - Oral

Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors.

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (Selenium)

### Reproductive toxicity

No data available

### Teratogenicity

Developmental Toxicity - Mouse - Oral

Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Fetal death.

No data available

### Specific target organ toxicity - single exposure (Globally Harmonized System)

No data available

### Specific target organ toxicity - repeated exposure (Globally Harmonized System)

May cause damage to organs through prolonged or repeated exposure.

### Aspiration hazard

No data available

### Potential health effects

<b>Inhalation</b>	Toxic if inhaled. May cause respiratory tract irritation.
<b>Ingestion</b>	Toxic if swallowed.
<b>Skin</b>	May be harmful if absorbed through skin. May cause skin irritation.
<b>Eyes</b>	May cause eye irritation.

### Signs and Symptoms of Exposure

anemia, Vomiting, Diarrhoea, Cough, Difficulty in breathing, Acute selenium poisoning produces central nervous system effects, which include nervousness, convulsions, and drowsiness. Other signs of intoxication can include skin eruptions, lassitude, gastrointestinal distress, teeth that are discolored or decayed, odorous ("garlic") breath, and partial loss of hair and nails. Chronic exposure by inhalation can produce symptoms that include pallor, coating of the tongue, anemia, irritation of the mucosa, lumbar pain, liver and spleen damage, as well as any of the other previously mentioned symptoms. Chronic contact with selenium compounds may cause garlic odor of breath and sweat, dermatitis, and moderate emotional instability., Dermatitis, garlic-like breath odor, pallor, nervousness, depression

### Synergistic effects

No data available

### Additional Information

RTECS: VS7700000

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## 12. ECOLOGICAL INFORMATION

### Toxicity

Toxicity to fish	mortality NOEC - <i>Cyprinodon variegatus</i> (sheepshead minnow) - 2 mg/l - 96.0 h
	mortality LOEC - <i>Oncorhynchus mykiss</i> (rainbow trout) - 7.8 mg/l - 96.0 h
Toxicity to daphnia and other aquatic invertebrates	LC50 - <i>Daphnia magna</i> (Water flea) - 0.43 mg/l - 48 h
Toxicity to algae	EC50 - <i>Pseudokirchneriella subcapitata</i> - 99 mg/l - 72 h

### Persistence and degradability

No data available

### Bioaccumulative potential

Bioaccumulation	<i>Lepomis macrochirus</i> - 60 d
	Bioconcentration factor (BCF): 7.7

**Mobility in soil**

No data available

**PBT and vPvB assessment**

No data available

**Other adverse effects**

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

**13. DISPOSAL CONSIDERATIONS****Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

**Contaminated packaging**

Dispose of as unused product.

**14. TRANSPORT INFORMATION****DOT (US)**

UN number: 3288 Class: 6.1 Packing group: III  
 Proper shipping name: Toxic solid, inorganic, n.o.s. (Selenium)  
 Reportable Quantity (RQ): 10 lbs  
 Marine pollutant: No  
 Poison Inhalation Hazard: No

**IMDG**

UN number: 3288 Class: 6.1 Packing group: III EMS-No: F-A, S-A  
 Proper shipping name: TOXIC SOLID, INORGANIC, N.O.S. (Selenium)  
 Marine pollutant: No

**IATA**

UN number: 3288 Class: 6.1 Packing group: III  
 Proper shipping name: Toxic solid, inorganic, n.o.s. (Selenium)

**15. REGULATORY INFORMATION****WHMIS Classification**

D1B	Toxic Material Causing Immediate and Serious Toxic Effects	Toxic by ingestion
D2B	Toxic Material Causing Other Toxic Effects	Toxic by inhalation. Chronic toxicity

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

**16. OTHER INFORMATION****Text of H-code(s) and R-phrases(s) mentioned in Section 3****Further information**

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