

## SAFETY DATA SHEET

Version 6.6  
Revision Date 09/12/2021  
Print Date 02/05/2022

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifiers**

Product name : Selenium

Product Number : 209643  
Brand : Aldrich  
Index-No. : 034-001-00-2  
CAS-No. : 7782-49-2

**1.2 Relevant identified uses of the substance or mixture and uses advised against**

Identified uses : Laboratory chemicals, Synthesis of substances

**1.3 Details of the supplier of the safety data sheet**

Company : Sigma-Aldrich Inc.  
3050 SPRUCE ST  
ST. LOUIS MO 63103  
UNITED STATES

Telephone : +1 314 771-5765  
Fax : +1 800 325-5052

**1.4 Emergency telephone**

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-  
527-3887 CHEMTREC (International) 24  
Hours/day; 7 Days/week

**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Acute toxicity, Oral (Category 3), H301  
Acute toxicity, Inhalation (Category 3), H331  
Specific target organ toxicity - repeated exposure (Category 2), H373  
Long-term (chronic) aquatic hazard (Category 4), H413

For the full text of the H-Statements mentioned in this Section, see Section 16.

**2.2 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) |                                                                                                          |
| P260                       | Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.                                                     |
| P264                       | Wash skin thoroughly after handling.                                                                     |
| P270                       | Do not eat, drink or smoke when using this product.                                                      |
| P271                       | Use only outdoors or in a well-ventilated area.                                                          |
| P273                       | Avoid release to the environment.                                                                        |
| P301 + P310 + P330         | IF SWALLOWED: Immediately call a POISON CENTER/ doctor.<br>Rinse mouth.                                  |
| P304 + P340 + P311         | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor. |
| P314                       | Get medical advice/ attention if you feel unwell.                                                        |
| P403 + P233                | Store in a well-ventilated place. Keep container tightly closed.                                         |
| P405                       | Store locked up.                                                                                         |
| P501                       | Dispose of contents/ container to an approved waste disposal plant.                                      |

### 2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

|                  |                |
|------------------|----------------|
| Formula          | : Se           |
| Molecular weight | : 78.96 g/mol  |
| CAS-No.          | : 7782-49-2    |
| EC-No.           | : 231-957-4    |
| Index-No.        | : 034-001-00-2 |

| Component       | Classification                                                           | Concentration |
|-----------------|--------------------------------------------------------------------------|---------------|
| <b>Selenium</b> |                                                                          |               |
|                 | Acute Tox. 3; STOT RE 2;<br>Aquatic Chronic 4; H301,<br>H331, H373, H413 | <= 100 %      |

For the full text of the H-Statements mentioned in this Section, see Section 16.

## SECTION 4: First aid measures

### 4.1 Description of first-aid measures

#### General advice

First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

#### If inhaled

After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

**In case of skin contact**

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

**In case of eye contact**

After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

**If swallowed**

If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible.

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

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

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

No data available

---

**SECTION 5: Firefighting measures****5.1 Extinguishing media****Suitable extinguishing media**

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Unsuitable extinguishing media**

For this substance/mixture no limitations of extinguishing agents are given.

**5.2 Special hazards arising from the substance or mixture**

Selenium/selenium oxides

Not combustible.

Ambient fire may liberate hazardous vapours.

**5.3 Advice for firefighters**

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

**5.4 Further information**

Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

---

**SECTION 6: Accidental release measures****6.1 Personal precautions, protective equipment and emergency procedures**

Advice for non-emergency personnel: Avoid generation and inhalation of dusts in all circumstances. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

For personal protection see section 8.

**6.2 Environmental precautions**

Do not let product enter drains.

### **6.3 Methods and materials for containment and cleaning up**

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

### **6.4 Reference to other sections**

For disposal see section 13.

---

## **SECTION 7: Handling and storage**

### **7.1 Precautions for safe handling**

#### **Advice on safe handling**

Work under hood. Do not inhale substance/mixture.

#### **Hygiene measures**

Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.

For precautions see section 2.2.

### **7.2 Conditions for safe storage, including any incompatibilities**

#### **Storage conditions**

Tightly closed. Dry. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Store under inert gas.

#### **Storage class**

Storage class (TRGS 510): 6.1C: Combustible, acute toxic Cat.3 / toxic compounds or compounds which causing chronic effects

### **7.3 Specific end use(s)**

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

---

## **SECTION 8: Exposure controls/personal protection**

### **8.1 Control parameters**

#### **Ingredients with workplace control parameters**

| Component | CAS-No.   | Value | Control parameters    | Basis                                                                                   |
|-----------|-----------|-------|-----------------------|-----------------------------------------------------------------------------------------|
| Selenium  | 7782-49-2 | TWA   | 0.2 mg/m <sup>3</sup> | USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants        |
|           |           | TWA   | 0.2 mg/m <sup>3</sup> | USA. ACGIH Threshold Limit Values (TLV)                                                 |
|           |           | TWA   | 0.2 mg/m <sup>3</sup> | USA. NIOSH Recommended Exposure Limits                                                  |
|           |           | PEL   | 0.2 mg/m <sup>3</sup> | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |

## 8.2 Exposure controls

### Appropriate engineering controls

Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.

### Personal protective equipment

#### Eye/face protection

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

#### Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: KCL 741 Dermatril® L

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: KCL 741 Dermatril® L

#### Body Protection

protective clothing

#### Respiratory protection

required when dusts are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

## Control of environmental exposure

Do not let product enter drains.

---

### SECTION 9: Physical and chemical properties

#### 9.1 Information on basic physical and chemical properties

|                                                 |                                                                                             |
|-------------------------------------------------|---------------------------------------------------------------------------------------------|
| a) Appearance                                   | Form: pellets<br>Color: light gray                                                          |
| b) Odor                                         | No data available                                                                           |
| c) Odor Threshold                               | No data available                                                                           |
| d) pH                                           | No data available                                                                           |
| e) Melting point/freezing point                 | Melting point/range: 217 °C (423 °F) - lit.                                                 |
| f) Initial boiling point and boiling range      | 684.9 °C 1264.8 °F - lit.                                                                   |
| g) Flash point                                  | ( )Not applicable                                                                           |
| h) Evaporation rate                             | No data available                                                                           |
| i) Flammability (solid, gas)                    | No data available                                                                           |
| j) Upper/lower flammability or explosive limits | No data available                                                                           |
| k) Vapor pressure                               | > 0.001 hPa at 20 °C (68 °F)                                                                |
| l) Vapor density                                | No data available                                                                           |
| m) Density                                      | 4.81 g/mL at 25 °C (77 °F) - lit.                                                           |
| Relative density                                | 4.8 at 25 °C (77 °F)                                                                        |
| n) Water solubility                             | 0.1 g/l at 20.9 °C (69.6 °F) - insoluble                                                    |
| o) Partition coefficient: n-octanol/water       | log Pow: 5Not applicable for inorganic substances                                           |
| p) Autoignition temperature                     | 220 - 250 °C (428 - 482 °F) at 1,013.25 hPa - Relative self-ignition temperature for solids |
| q) Decomposition temperature                    | No data available                                                                           |
| r) Viscosity                                    | No data available                                                                           |
| s) Explosive properties                         | No data available                                                                           |
| t) Oxidizing properties                         | none                                                                                        |

#### 9.2 Other safety information

No data available

---

### SECTION 10: Stability and reactivity

#### 10.1 Reactivity

No data available

Aldrich - 209643

Page 6 of 11

## 10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

## 10.3 Possibility of hazardous reactions

Risk of explosion with:

alkali amides

Metals

Oxygen

amides

cadmium

Potassium

sodium

nitrogen oxides

Tin

nitrogen trichloride

Risk of ignition or formation of inflammable gases or vapours with:

carbides

peroxi compounds

halogen-halogen compounds

halogen oxides

Fluorine

lithium silicide

barium peroxide

Uranium

Generates dangerous gases or fumes in contact with:

hydrochloric acid

sulfuric acid

Exothermic reaction with:

powdered aluminium

Beryllium

bromates

chromium(VI) oxide

chlorates

Nickel

Oxidizing agents

phosphorus

platinum

Nitric acid

silver oxide

Zinc

Alkali metals

## 10.4 Conditions to avoid

no information available

## 10.5 Incompatible materials

No data available

## 10.6 Hazardous decomposition products

In the event of fire: see section 5

---

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Acute toxicity estimate Oral - Expert judgment - 100.1 mg/kg

Symptoms: Gastrointestinal disturbance

Acute toxicity estimate Inhalation - Expert judgment - 4 h - 0.51 mg/l

Dermal: No data available

No data available

#### Skin corrosion/irritation

Skin - reconstructed human epidermis (RhE)

Result: No skin irritation

(OECD Test Guideline 431)

#### Serious eye damage/eye irritation

Eyes - Bovine cornea

Result: No eye irritation - 4 h

(OECD Test Guideline 437)

#### Respiratory or skin sensitization

Local lymph node assay (LLNA) - Mouse

Result: negative

(OECD Test Guideline 429)

#### Germ cell mutagenicity

Test Type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: negative

Test Type: Chromosome aberration test

Species: Mouse

Cell type: Bone marrow

Application Route: Intraperitoneal

Result: negative

Remarks: (ECHA)

#### Carcinogenicity

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: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

#### Reproductive toxicity

No data available

#### Specific target organ toxicity - single exposure

No data available



### **Specific target organ toxicity - repeated exposure**

May cause damage to organs through prolonged or repeated exposure. **Aspiration hazard**

No data available

## **11.2 Additional Information**

Repeated dose toxicity - Rat - male and female - Oral - 13 Weeks - NOAEL (No observed adverse effect level) - 0.4 mg/kg

Remarks: (in analogy to similar products)

The value is given in analogy to the following substances: Sodium selenite

RTECS: VS7700000

anemia, Vomiting, Diarrhea, 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

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

After absorption:

CNS disorders

Dizziness

muscular weakness

Headache

cardiovascular disorders

Shortness of breath

somnolence

Cough

Unconsciousness

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

---

## **SECTION 12: Ecological information**

### **12.1 Toxicity**

|                  |                                                                                                                                                                          |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Toxicity to fish | semi-static test LC50 - Oncorhynchus mykiss (rainbow trout) - > 100 mg/l - 96 h<br>(OECD Test Guideline 203)<br>Remarks: (above the solubility limit in the test medium) |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Aldrich - 209643

Page 9 of 11

|                                                     |                                                                                                                                                                       |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Toxicity to daphnia and other aquatic invertebrates | static test EC50 - Daphnia magna (Water flea) - > 100 mg/l - 48 h (OECD Test Guideline 202)<br>Remarks: (above the solubility limit in the test medium)               |
| Toxicity to algae                                   | static test ErC50 - Pseudokirchneriella subcapitata (algae) - > 100 mg/l - 72 h (OECD Test Guideline 201)<br>Remarks: (above the solubility limit in the test medium) |
| Toxicity to bacteria                                | static test EC50 - activated sludge - > 3,200 mg/l - 3 h (OECD Test Guideline 209)                                                                                    |

## 12.2 Persistence and degradability

The methods for determining the biological degradability are not applicable to inorganic substances.

## 12.3 Bioaccumulative potential

Bioaccumulation Lepomis macrochirus - 60 d  
- 640 µg/l(Selenium)

Bioconcentration factor (BCF): 7.7

## 12.4 Mobility in soil

No data available

## 12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

## 12.6 Other adverse effects

Discharge into the environment must be avoided.

---

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

#### Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See [www.retrologistik.com](http://www.retrologistik.com) for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

---

## SECTION 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): 100 lbs  
Reportable Quantity (RQ): 10 lbs  
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)

**IATA**

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

---

**SECTION 15: Regulatory information**

**SARA 302 Components**

This material does not contain any components with a section 302 EHS TPQ.

**SARA 313 Components**

The following components are subject to reporting levels established by SARA Title III, Section 313:

|          |                      |                             |
|----------|----------------------|-----------------------------|
| Selenium | CAS-No.<br>7782-49-2 | Revision Date<br>2007-07-01 |
|----------|----------------------|-----------------------------|

**SARA 311/312 Hazards**

Acute Health Hazard, Chronic Health Hazard

:  
**Reportable Quantity**      D010 lbs

**Massachusetts Right To Know Components**

No components are subject to the Massachusetts Right to Know Act.

---

**SECTION 16: Other information**

**Further information**

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See [www.sigma-aldrich.com](http://www.sigma-aldrich.com) and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Copyright 2020 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact [mlsbranding@sial.com](mailto:mlsbranding@sial.com).

Version: 6.6                      Revision Date: 09/12/2021                      Print Date: 02/05/2022