

## 1 Identification

### Product identifier

**Product name:** Copper(I) selenide

**Stock number:** 22780

**CAS Number:**

20405-64-5

**EC number:**

243-796-7

**Index number:**

034-002-00-8

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

**Identified use:** SU24 Scientific research and development

### Details of the supplier of the safety data sheet

#### Manufacturer/Supplier:

Alfa Aesar  
Thermo Fisher Scientific Chemicals, Inc.  
30 Bond Street  
Ward Hill, MA 01835-8099  
Tel: 800-343-0660  
Fax: 800-322-4757  
Email: tech@alfa.com  
www.alfa.com

**Information Department:** Health, Safety and Environmental Department

#### Emergency telephone number:

During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

## 2 Hazard(s) identification

### Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)



GHS06 Skull and crossbones

Acute Tox. 3 H301 Toxic if swallowed.

Acute Tox. 3 H331 Toxic if inhaled.



GHS08 Health hazard

STOT RE 2 H373 May cause damage to the central nervous system, the liver and the digestive system through prolonged or repeated exposure. Route of exposure: Oral, Inhalative.

**Hazards not otherwise classified** No information known.

### Label elements

**GHS label elements** The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

### Hazard pictograms



GHS06 GHS08

### Signal word

**Danger**

### Hazard statements

H301+H331 Toxic if swallowed or if inhaled.

H373 May cause damage to the central nervous system, the liver and the digestive system through prolonged or repeated exposure. Route of exposure: Oral, Inhalative.

### Precautionary statements

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor/...

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P405 Store locked up.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

### WHMIS classification

D1A - Very toxic material causing immediate and serious toxic effects



### Classification system

#### HMIS ratings (scale 0-4)

(Hazardous Materials Identification System)

HEALTH 2 Health (acute effects) = 2

FIRE 0 Flammability = 0

REACTIVITY 1 Physical Hazard = 1

### Other hazards

#### Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

## 3 Composition/information on ingredients

### Chemical characterization: Substances

#### CAS# Description:

20405-64-5 Copper(I) selenide

#### Identification number(s):

EC number: 243-796-7

Index number: 034-002-00-8

**Product name: Copper(I) selenide**

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**4 First-aid measures**

**Description of first aid measures**

**General information**

Immediately remove any clothing soiled by the product.  
Remove breathing apparatus only after contaminated clothing has been completely removed.  
In case of irregular breathing or respiratory arrest provide artificial respiration.

**After inhalation**

Supply fresh air. If required, provide artificial respiration. Keep patient warm.  
Seek immediate medical advice.

**After skin contact**

Immediately wash with water and soap and rinse thoroughly.  
Seek immediate medical advice.

**After eye contact** Rinse opened eye for several minutes under running water. Then consult a doctor.

**After swallowing** Do not induce vomiting; immediately call for medical help.

**Information for doctor**

**Most important symptoms and effects, both acute and delayed** No further relevant information available.

**Indication of any immediate medical attention and special treatment needed** No further relevant information available.

**5 Fire-fighting measures**

**Extinguishing media**

**Suitable extinguishing agents** Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

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

If this product is involved in a fire, the following can be released:

Toxic metal oxide fume

**Advice for firefighters**

**Protective equipment:**

Wear self-contained respirator.

Wear fully protective impervious suit.

**6 Accidental release measures**

**Personal precautions, protective equipment and emergency procedures**

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

**Environmental precautions:** Do not allow material to be released to the environment without proper governmental permits.

**Methods and material for containment and cleaning up:**

Dispose of contaminated material as waste according to section 13.

Ensure adequate ventilation.

**Prevention of secondary hazards:** No special measures required.

**Reference to other sections**

See Section 7 for information on safe handling

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

**7 Handling and storage**

**Handling**

**Precautions for safe handling**

Keep container tightly sealed.

Store in cool, dry place in tightly closed containers.

Ensure good ventilation at the workplace.

Open and handle container with care.

**Information about protection against explosions and fires:** No information known.

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

**Storage**

**Requirements to be met by storerooms and receptacles:** No special requirements.

**Information about storage in one common storage facility:** No information known.

**Further information about storage conditions:**

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

**Specific end use(s)** No further relevant information available.

**8 Exposure controls/personal protection**

**Additional information about design of technical systems:**

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

**Control parameters**

**Components with limit values that require monitoring at the workplace:**

Copper

mg/m3  
ACGIH TLV 1 (dust, mist)  
0.2 (fume)

Austria MAK 1  
0.1 (fume)

Belgium TWA 0.2 (fume)

Denmark TWA 1 (dust)

Finland TWA 0.1

France VME 0.2 (fume)

Germany MAK 1 (dust)

1; 2-STEL (dust)

Germany MAK 0.1 (fume)

Hungary TWA 1 (dust)

0.2; 0.4-STEL (dust)

Korea TLV 1 (dust, mist)

0.2 (fume)

Netherlands MAC-TGG 1 (dust)

Norway TWA 0.05

Poland TWA 0.1 (fume)

0.1; 0.3-STEL (fume)

Russia 1; 2-STEL (dust)

1-STEL (dust)

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Product name: **Copper(I) selenide** (Contd. of page 2)

Sweden NGV 0.2 (resp. dust)  
1 (total dust)  
Switzerland MAK-W 0.1; 0.2-KZG-W (fume)  
1; 1-KZG-W  
United Kingdom TWA 0.2 (fume)  
1; 2-STEL (dust, mist)  
1; 3-STEL  
USA PEL TWA 0.1 (fume)  
1 (dust, mist)

Selenium and selenium compounds (as Se)

mg/m3  
ACGIH TLV 0.2  
Austria MAK 0.1  
Belgium TWA 0.2  
Denmark TWA 0.1  
Finland TWA 0.1; 0.3-STEL  
Germany MAK 0.1  
Hungary 0.1-STEL  
Ireland TLV 0.1  
Japan OEL 0.1  
Korea TLV 0.2  
Netherlands MAC-TGG 0.1  
Poland TWA 0.1; 0.3-STEL  
Sweden NGV 0.1  
Switzerland MAK-W 0.1  
United Kingdom TWA 0.1  
USA PEL 0.2

Copper  
mg/m3  
ACGIH TLV 1 (dust, mist); 0.2 (fume)  
Austria MAK 1  
0.1 (fume)  
Belgium TWA 0.2 (fume); 1 (dust)  
Denmark TWA 0.1  
Finland TWA 0.2 (fume); 1 (dust)  
France VME 0.2 (fume); 1 (dust)  
1; 2-STEL (dust)  
Germany MAK 0.1 (fume); 1 (dust)  
Hungary TWA 0.2; 0.4-STEL (dust)  
Netherlands MAC-TGG 1 (dust)  
Norway TWA 0.05  
0.1 (fume)  
Poland TWA 0.1; 0.3-STEL (fume)  
1; 2-STEL (dust)  
Russia 1-STEL (dust)  
Sweden NGV 0.2 (resp. dust); 1 (total dust)  
Switzerland MAK-W 0.1; 0.2-KZG-W (fume)  
1; 1-KZG-W  
United Kingdom TWA 0.2 (fume)  
1; 2-STEL (dusts and mists as Cu)  
1; 3-STEL  
USA PEL 0.1 (fume, dusts & mists)

Additional information: No data

Exposure controls

Personal protective equipment

General protective and hygienic measures

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Maintain an ergonomically appropriate working environment.

Breathing equipment: Use self-contained respiratory protective device in emergency situations.

Protection of hands:

Impervious gloves

Check protective gloves prior to each use for their proper condition.

The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

Eye protection: Safety glasses

Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties

General Information

Appearance:

Form: Lump  
Color: Black  
Odor: Not determined  
Odor threshold: Not determined.

pH-value: Not applicable.

Change in condition

Melting point/Melting range: 1113 °C (2035 °F)  
Boiling point/Boiling range: Not determined  
Sublimation temperature / start: Not determined

Flash point: Not applicable  
Flammability (solid, gaseous): Not determined.  
Ignition temperature: Not determined  
Decomposition temperature: Not determined  
Auto igniting: Not determined.

Product name: **Copper(I) selenide**

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|   |   |
|---|---|
| <b>Danger of explosion:</b>                     | Product does not present an explosion hazard. |
| <b>Explosion limits:</b>                        |   |
| Lower:  | Not determined                                |
| Upper:  | Not determined                                |
| <b>Vapor pressure:</b>                          | Not applicable.                               |
| <b>Density at 20 °C (68 °F):</b>                | 6.749 g/cm <sup>3</sup> (56.32 lbs/gal)       |
| <b>Relative density</b>                         | Not determined.                               |
| <b>Vapor density</b>                            | Not applicable.                               |
| <b>Evaporation rate</b>                         | Not applicable.                               |
| <b>Solubility in / Miscibility with</b>         |   |
| Water:  | Not determined                                |
| <b>Partition coefficient (n-octanol/water):</b> | Not determined.                               |
| <b>Viscosity:</b>                               |   |
| dynamic:  | Not applicable.                               |
| kinematic:                                      | Not applicable.                               |
| <b>Other information</b>                        | No further relevant information available.    |

**10 Stability and reactivity**

**Reactivity** No information known.  
**Chemical stability** Stable under recommended storage conditions.  
**Thermal decomposition / conditions to be avoided:** Decomposition will not occur if used and stored according to specifications.  
**Possibility of hazardous reactions** No dangerous reactions known  
**Conditions to avoid** No further relevant information available.  
**Incompatible materials:** No information known.  
**Hazardous decomposition products:** Toxic metal oxide fume

**11 Toxicological information**

**Information on toxicological effects**  
**Acute toxicity:**  
Toxic if inhaled.  
Toxic if swallowed.  
**LD/LC50 values that are relevant for classification:** No data  
**Skin irritation or corrosion:** Irritant to skin and mucous membranes.  
**Eye irritation or corrosion:** Irritating effect.  
**Sensitization:** No sensitizing effects known.  
**Germ cell mutagenicity:** No effects known.  
**Carcinogenicity:** IARC-3: Not classifiable as to carcinogenicity to humans.  
**Reproductive toxicity:** No effects known.  
**Specific target organ system toxicity - repeated exposure:**  
May cause damage to the central nervous system, the liver and the digestive system through prolonged or repeated exposure. Route of exposure: Oral, Inhalative.  
**Specific target organ system toxicity - single exposure:** No effects known.  
**Aspiration hazard:** No effects known.  
**Subacute to chronic toxicity:**  
Selenium may cause amyotrophic lateral sclerosis, bronchial irritation, gastrointestinal distress, vasopharyngeal irritation, garlic odor on breath and sweat, metallic taste, pallor, irritability, excessive fatigue, loss of fingernails and hair, pulmonary edema, anemia and weight loss.  
Copper compounds may be irritating to the skin, eyes and respiratory tract. They may cause metal fume fever, hemolysis of the red blood cells and injury to the liver, lungs, kidneys and pancreas. Ingestion may also cause vomiting, gastric pain, dizziness, anemia, cramps, convulsions, shock, coma and death.  
**Subacute to chronic toxicity:** No effects known.  
**Additional toxicological information:** To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

**12 Ecological information**

**Toxicity**  
**Aquatic toxicity:** No further relevant information available.  
**Persistence and degradability** No further relevant information available.  
**Bioaccumulative potential** No further relevant information available.  
**Mobility in soil** No further relevant information available.  
**Ecotoxicological effects:**  
**Remark:** Very toxic for aquatic organisms  
**Additional ecological information:**  
**General notes:**  
Do not allow material to be released to the environment without proper governmental permits.  
Do not allow product to reach ground water, water course or sewage system, even in small quantities.  
Danger to drinking water if even extremely small quantities leak into the ground.  
Also poisonous for fish and plankton in water bodies.  
May cause long lasting harmful effects to aquatic life.  
Avoid transfer into the environment.  
Very toxic for aquatic organisms  
**Results of PBT and vPvB assessment**  
**PBT:** Not applicable.  
**vPvB:** Not applicable.  
**Other adverse effects** No further relevant information available.

**13 Disposal considerations**

**Waste treatment methods**  
**Recommendation** Consult state, local or national regulations to ensure proper disposal.  
**Uncleaned packagings:**  
**Recommendation:** Disposal must be made according to official regulations.

**14 Transport information**

|   |   |
|---|---|
| <b>UN-Number</b><br><b>DOT, IMDG, IATA</b>                        | UN3077  |
| <b>UN proper shipping name</b><br><b>DOT</b><br><b>IMDG, IATA</b> | Environmentally hazardous substances, solid, n.o.s. (copper(I) selenide)<br>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (copper(I) selenide) |

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USA

**Product name: Copper(I) selenide**

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**Transport hazard class(es)**

DOT, IMDG



Class  
Label  
Class  
Label  
IATA

9 Miscellaneous dangerous substances and articles.  
9  
9 (M7) Miscellaneous dangerous substances and articles  
9



Class  
Label

9 Miscellaneous dangerous substances and articles.  
9

**Packing group**  
DOT, IMDG, IATA

III

**Environmental hazards:**

**Special marking (ADR):**

Symbol (fish and tree)

**Special marking (IATA):**

Symbol (fish and tree)

**Special precautions for user**

Warning: Miscellaneous dangerous substances and articles

**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.

**Transport/Additional information:**

DOT

**Marine Pollutant (DOT):**

No

**UN "Model Regulation":**

UN3077, Environmentally hazardous substances, solid, n.o.s. (copper(I) selenide),  
9, III

**15 Regulatory information**

**Safety, health and environmental regulations/legislation specific for the substance or mixture**

**GHS label elements** The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

**Hazard pictograms**



GHS06 GHS08

**Signal word** Danger

**Hazard statements**

H301+H331 Toxic if swallowed or if inhaled.

H373 May cause damage to the central nervous system, the liver and the digestive system through prolonged or repeated exposure. Route of exposure: Oral, Inhalative.

**Precautionary statements**

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor/...

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P405 Store locked up.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

**National regulations**

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

All components of this product are listed on the Canadian Domestic Substances List (DSL).

**SARA Section 313 (specific toxic chemical listings)**

20405-64-5 Copper(I) selenide

**California Proposition 65**

**Prop 65 - Chemicals known to cause cancer** Substance is not listed.

**Prop 65 - Developmental toxicity** Substance is not listed.

**Prop 65 - Developmental toxicity, female** Substance is not listed.

**Prop 65 - Developmental toxicity, male** Substance is not listed.

**Information about limitation of use:**

For use only by technically qualified individuals.

This product contains selenium and is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

This product contains copper and is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

**Other regulations, limitations and prohibitive regulations**

**Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.** Substance is not listed.

**The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.**

Substance is not listed.

**Annex XIV of the REACH Regulations (requiring Authorisation for use)** Substance is not listed.

**Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

**16 Other information**

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing SDS:** Global Marketing Department

**Date of preparation / last revision** 11/24/2015 / -

**Abbreviations and acronyms:**

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organization

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

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USA



|   |  |
|---|--|
| Product name: Copper(I) selenide  |  |
| <div>IMDG: International Maritime Code for Dangerous Goods<br/>DOT: US Department of Transportation<br/>IATA: International Air Transport Association<br/>EINECS: European Inventory of Existing Commercial Chemical Substances<br/>CAS: Chemical Abstracts Service (division of the American Chemical Society)<br/>HMIS: Hazardous Materials Identification System (USA)<br/>WHMIS: Workplace Hazardous Materials Information System (Canada)<br/>LC50: Lethal concentration, 50 percent<br/>LD50: Lethal dose, 50 percent<br/>vPvB: very Persistent and very Bioaccumulative<br/>ACGIH: American Conference of Governmental Industrial Hygienists (USA)<br/>OSHA: Occupational Safety and Health Administration (USA)<br/>NTP: National Toxicology Program (USA)<br/>IARC: International Agency for Research on Cancer<br/>EPA: Environmental Protection Agency (USA)</div> | <div>(Contd. of page 5)</div> <div>USA</div> |