

Safety Data Sheet

1. Identification of the Substance and of the Supplier

Product Identification : Zinc Selenide, ZnSe (with coating film)
General Use : Optical Element
Description : Inorganic Crystalline Material
Manufacturer : Sumitomo Electric Hardmetal Corp.
1-1-1, Koya-kita, Itami, Hyogo, 664-0016 Japan
Emergency Telephone : +81-72-771-0555 (8:30-17:15 JST) (Environmental administrator)

2. Hazard Identification

Danger from Fire

Zinc selenide is non flammable when it is in a solid state, thus there is no chance to be a cause of fire. Flash point, flammable limits and explosion limits have not been found.

Toxicity

Zinc selenide is stable under the general condition. But chemical reaction with acids may liberate hazardous gases. Thermal decomposition may liberate selenium products or toxic fumes.

Toxicological Information. Other selenium compounds such as selenium hydrogen, oxidation selenium, selenic acid, selenious acid have toxicity. In addition, inhaling fume of zinc oxide may cause chills or high fever several hours later.

Environmental Impact

There is no information available to be harmful regarding zinc selenide.

GHS Classification : Classified on Dec.12,2025

Physical and Chemical Hazards: Classification not possible

Health Hazards:

Acute Toxicity (Oral) Not Classified*

Acute Toxicity (dermal) Not Classified*

Specific target organ toxicity (simple exposure) Not Classified*

Specific target organ toxicity (repeated exposure) Classification not possible

Environment Hazards: Classification not possible

*Compliant with OECD Test Guideline

GHS Label Element : None

Precautionary measures:

Do not breathe dust/fume/gas/mist/vapors/spray.

Wash thoroughly after handling.

Do not eat, drink or smoke when using this product.

Avoid release to the environment.

Response Precautionary Statement:

If skin contacted and injured (such as an incised wound), get medical attention.

If eye contacted, flush eyes with plenty of water for at least 15minutes. Irritation persists, get medical attention.

If swallowed, rinse mouth with water induce vomiting and get medical attention immediately: Do not try to neutralize by acid or alkali

Storage: Store locked up.

Disposal : Contents/containers should be disposed in compliance with local regulations

Other Hazards: None

3. Composition / Information on Ingredients

Chemical Formula, or Name	Weight % of ingredients	CAS No.	Classification No. by PRTR Law	Enforcement Serial No. by Industrial Safety and Health Laws
ZnSe	>99%	1315-09-9	Class 1-No.242	No. 9-333 Table
Metal fluorides	<1%	-	-	-

Metal fluorides, including BaF₂ (CAS No.7787-32-8), are used as coating films.

Radioactive materials (e.g. Thorium fluoride, ThF₄) are never used at the Manufacturer.

Germanium (Ge, CAS 7440-56-4) can be used a little for special coatings.

The design and material composition of the coating films are protected as confidential business information (CBI).

4. First-Aid Measures

Skin contact

Wash the diseased part with soap and water. If irritation persists, get medical attention.

Eye contact

Flush eyes immediately with large amount of water or normal saline for at least 15minutes.If irritation persists, get medical attention.

Inhalation

Remove from exposure area to fresh air immediately. Perform artificial respiration if necessary. Keep person warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

Ingestion

Rinse mouth with water. Induce vomiting and get medical attention immediately.

5. Fire Fighting Measures

Flash Point: Not applicable

Explosive Limits: LEL(%) Not applicable UEL(%) Not applicable

Autoignition Temperature: Not applicable

Extinguish Media: Use carbon dioxide or dry chemicals.

Special Fire Fighting and Unusual Fire and Explosion Hazards

This product dose not burn. But decomposition may take place from overheating in air with toxic vapors. Exhaust adequately and wear air respirator and protective clothing where ZnSe is being decomposed.

For large fires, which cannot easily be extinguished with a portable fire extinguisher, escape from fires.

6. Accidental Release Measures

Collect the spilled and leaked ZnSe by sweeping them up. If they have been crushed and turned into dust, use methods such as vacuuming to recover them. Do not wash them away with water and discharge them into the sewer. Paper, cloths, mops or other materials used to recover them must be disposed of by the technical industrial waste disposal contractor in compliance with local regulations.

7. Handling and Storage

Storage

Keep dry and store in a clean environment.
Store separate from acids and alkalis.
If heated, or exposed to strong acids or alkalis, oxides may be liberated which are toxic.

Handling

Avoid breathing dusts and fumes, if generated. Use adequate ventilation and protective equipment.

8. Exposure Control/Personal Protection

Ensure that the concentration of suspended dust does not exceed the occupational exposure limit listed in the table below by the local exhaust ventilation systems. Dust masks and respiratory protective equipment should also be utilized

Constituent	Chemical Formula	OSHA* PEL* mg/m ³ (Dust concentration)	ACGIH* TLV* mg/m ³ (Dust concentration)	JSOH* OEL* mg/m ³
ZnSe	ZnSe	—	0.2 (as selenium)	0.1 (as selenium)

- *OSHA : Occupational Safety & Health Administration U.S. Department.
- *PEL : Permissible Exposure Limit.
- *ACGIH : American Conference of Governmental Industrial Hygienists Inc.
- *TLV : Threshold Limit Value.
- *JSOH :Japan Society for Occupational Health
- *OELs :Occupational Exposure Limit

Equipment measures

To avoid the risk contact with scattering fragment or powder of ZnSe by sudden breakage of ZnSe optical components.

ZnSe optical component should be entirely covered or used in equipment with local exhaust ventilation.

Ventilation

- Local Exhaust: Use for cutting, grinding, polishing and etching.
- Special Exhaust: Vent into water or efficient bag house.
- General Exhaust: Use good general ventilation.

Respiratory Protection

Use NIOSH/MSHA approved purifying respirator for lighter airborne concentrations.
Use a positive pressure, air supplied respirator if there is any potential for uncontrolled release, exposure levels are not known or high concentration.

Eye protection

Safety glasses, goggles or face shield.

Skin protection

Recommend protective clothing such as rubber gloves, apron and whole body suits for preventing dust.

Personal Hygienic

Avoid dust generation. Wash thoroughly after handling. Change contaminated clothes to clean ones.

9. Physical and Chemical Properties

- Physical state** : solid
- Color** : Transparent yellow orange
- Odor** : odorless
- Melting point** : 1520°C

Boiling point or initial boiling point and boiling range : Not applicable

Flammability : non-inflammables

Lower and upper explosion limit / flammability limit : —

Flash point : Not applicable

Auto-ignition temperature : Not applicable

Decomposition temperature : Not applicable

pH : —

Kinematic viscosity : Not applicable

Solubility : Insoluble in water

Partition coefficient n-octanol/water : Not applicable

Vapor pressure (Pa) : —

Density and/or relative density : 5.27

Relative vapor density : Not applicable

Particle characteristics : —

10. Stability and Reactivity

Stability

Stable under normal condition.

Materials to avoid

Contact with acids (HCl, H₂SO₄ etc.) may liberate hydrogen selenide.

Hazardous Polymerization

Will not occur.

Thermal Decomposition products

Thermal decomposition may occur at high temperature due to a fire.

The decomposition products include zinc and selenium fumes, oxides of selenium, or zinc oxide.

11. Toxicological Information

Zinc selenide is stable compounds under the general condition and the toxicity is not confirmed. In addition, there is no knowledge of animal study results.

Acute toxicity:

Oral

In an acute oral toxicity test^{*1} using 6 rats (oral administration of 2000 mg/kg (body weight) of powdered ZnSe followed by 14-day observation), no deaths occurred during the test period, and no abnormalities were found in any of the autopsies (cranial cavity, thoracic cavity, abdominal cavity, lymph nodes). For these reasons, it was classified as Not Classified.

Dermal

In an acute dermal toxicity test^{*2} using 3 rats (2000 mg/kg (body weight) of powdered ZnSe was applied to the back for 24 hours, followed by 14-day observation after removal), no deaths occurred during the test period, and no abnormalities were found in any of the autopsies (cranial cavity, thoracic cavity, abdominal cavity, lymph nodes). For these reasons, it was classified as Not Classified.

Respiratory (gases)

Classification not possible because it is solid in the definition of GHS

Respiratory (Vapors)

Classification not possible because of lack of data.

Respiratory (Dust/Mist)

Classification not possible because of lack of data.

Skin Corrosion/Irritation

In the acute dermal toxicity test mentioned above, no abnormalities were observed in the general condition, and therefore it was classified as Not Classified.

Serious Eye Damage/Irritation

Classification not possible because of lack of data.

Respiratory or Skin Sensitization

Classification not possible because of lack of data.

Germ Cell Mutagenicity

Classification not possible because of lack of data.

Carcinogenicity

Classification not possible because of lack of data.

Reproductive Toxicity

Classification not possible because of lack of data.

Specific target organ toxicity (simple exposure)

In acute oral toxicity tests and acute dermal toxicity tests, no abnormalities were found in any of the autopsies (cranial cavity, thoracic cavity, abdominal cavity, lymph nodes). For these reasons, it was classified as Not Classified.

Specific target organ toxicity (repeated exposure)

Classification not possible because of lack of data.

Aspiration Hazard

Classification not possible because of lack of data.

Others (Production of poisonous gas by reaction with water etc.)

None

*1 Compliant with OECD Test Guideline No. 423 (Adopted: 17 Dec. 2001)

*2 Compliant with OECD Test Guideline No. 402 (Adopted: 9 Oct. 2017)

12. Ecological information

General notes: Do not allow material to be released to the environment without proper governmental permits.

13. Disposal Consideration

Scrap, waste and rejections should be disposed in compliance with local, state and federal laws and regulations (contact local or state environmental agency for specific rules).

14. Transport Information

ZnSe material should be wrapped in lens tissue or optical tissue and placed in individual boxes to avoid possible breakage.

Not a hazardous material for transportation.

UN Number : Not applicable
Proper shipping name: Not applicable
Hazard class : Not applicable
Packing group : Not applicable

15. Regulatory Information (Japanese Applicable Law)

PRTR Law

[Selen and selenide are Class 1-designated chemical substances.

Preparation of SDS is obligatory.: Ministry of Economy, Trade & Industry, Ministry of Environment.]

Occupational Safety & Health Administration Law.

[Preparation of MSDS is obligatory.: Ministry of Health, Labor & Welfare]

Law on the Evaluation of Chemical Substances and Regulation of their Manufactures, etc.

Reference Number in Gazetted List in Japan : 573

Note: ZnSe without coating film is applicable to Poisonous and Deleterious Substances Control Law.

16. Other Information

Notes on the following descriptions

The details in this SDS have been based on our best investigation and evidences.

The information may be revised according to new evidences, test etc., however, the accuracy and safety of the information are not a guaranteed value.

All chemical agents may contain unknown harmful substances: therefore, the companies and operators, using this MSDS, are requested to take appropriate actions according to their own conditions on their own responsibility.

- * Homepage of Ministry of Economy, Trade & Industry : <https://www.meti.go.jp/>
- * Homepage of Ministry of Environment : <https://www.env.go.jp/>
- * Homepage of Ministry of Health, Labor & Welfare : <https://www.mhlw.go.jp/>
- * Supplier of ICSC Cards : <http://www.nihs.go.jp/ICSC/>