Zinc sulfide
sc-251452

Material Safety Data Sheet

Hazard Alert Code Key: EXTREME HIGH MODERATE LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Zinc sulfide

STATEMENT OF HAZARDOUS NATURE

NFPA

SUPPLIER
Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800

EMERGENCY
ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS
ZnS, "sphalerite mineral", Sachtolith

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Toxicity</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Body Contact</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Reactivity</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Chronic</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

CANADIAN WHMIS SYMBOLS
None

EMERGENCY OVERVIEW
Very toxic to aquatic organisms.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS
SWALLOWED
- Although ingestion is not thought to produce harmful effects, the material may still be damaging to the health of the individual following ingestion, especially where pre-existing organ (e.g. liver, kidney) damage is evident.
- Accidental ingestion of the material may be damaging to the health of the individual.
- Soluble zinc salts produces irritation and corrosion of the alimentary tract with pain, and vomiting.
- Death can occur due to insufficiency of food intake due to severe narrowing of the esophagus and pylorus.
- If ingested, sulfide salts can form hydrogen sulfide, causing headache, cyanosis, low blood pressure, loss of consciousness, tremors and convulsions.

EYE
- Although the material is not thought to be an irritant, direct contact with the eye may cause transient discomfort characterized by tearing or conjunctival redness (as with windburn).
- Slight abrasive damage may also result.

SKIN
- The material is not thought to produce adverse health effects or skin irritation following contact (as classified using animal models).
- Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
- Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.
- Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED
- The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified using animal models).
- Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.
- There is some evidence to suggest that the material can cause respiratory irritation in some persons.
- The body's response to such irritation can cause further lung damage.
- Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

CHRONIC HEALTH EFFECTS
- Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified using animal models); nevertheless exposure by all routes should be minimized as a matter of course.
- Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.
- Welding or flame cutting of metals with zinc or zinc dust coatings may result in inhalation of zinc oxide fume; high concentrations of zinc oxide fume may result in "metal fume fever"; also known as "brass chills", an industrial disease of short duration. [[L.O] Symptoms include malaise, fever, weakness, nausea and may appear quickly if operations occur in enclosed or poorly ventilated areas.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>NAME</th>
<th>CAS RN</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>zinc sulfide</td>
<td>1314-98-3</td>
<td>&gt;98</td>
</tr>
</tbody>
</table>

Section 4 - FIRST AID MEASURES

- If swallowed do NOT induce vomiting. · If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

EYE
- If this product comes in contact with the eyes: · Wash out immediately with fresh running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

SKIN
- If skin or hair contact occurs: · Flush skin and hair with running water (and soap if available). · Seek medical attention in event of irritation.

INHALED
- If fumes or combustion products are inhaled remove from contaminated area. · Other measures are usually unnecessary.

NOTES TO PHYSICIAN
- Absorption of zinc compounds occurs in the small intestine.
- The metal is heavily protein bound.
- For exposures involving sulfides and hydrogen sulfide (including gastric acid decomposition products of alkaline sulfides).
- Hydrogen sulfide anion produces its major toxic effect through inhibition of cytochrome oxidases.
- Symptoms include profuse salivation, nausea, vomiting and diarrhea. Central nervous effects may include giddiness, headache, vertigo, amnesia, confusion and unconsciousness. Tachypnea, palpitation, tachycardia, arrhythmia, sweating, weakness and muscle cramps may also indicate over-exposures.

Section 5 - FIRE FIGHTING MEASURES

<table>
<thead>
<tr>
<th>Vapour Pressure (mmHG):</th>
<th>Not applicable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Explosive Limit (%):</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
Specific Gravity (water=1): 3.98-4.102
Lower Explosive Limit (%): Not applicable

**EXTINGUISHING MEDIA**
- Water spray or fog.
- Foam.

**FIRE FIGHTING**
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves for fire only.
When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 100 metres in all directions.

**GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS**
- Non combustible.
- Not considered to be a significant fire risk, however containers may burn.
Decomposition may produce toxic fumes of: sulfur oxides (SOx), sulfur dioxide (SO2), hydrogen sulfide (H2S), metal oxides.

**FIRE INCOMPATIBILITY**
- None known.

**PERSONAL PROTECTION**
- Glasses: Chemical goggles.
- Gloves:
- Respirator: Particulate

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**Section 6 - ACCIDENTAL RELEASE MEASURES**

**MINOR SPILLS**
- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact by using protective equipment.
- Use dry clean up procedures and avoid generating dust.
- Place in a suitable, labelled container for waste disposal.

**MAJOR SPILLS**
- Environmental hazard - contain spillage.
- Moderate hazard.
- CAUTION: Advise personnel in area.
- Alert Emergency Responders and tell them location and nature of hazard.

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**Section 7 - HANDLING AND STORAGE**

**PROCEDURE FOR HANDLING**
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.

**RECOMMENDED STORAGE METHODS**
- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.

**STORAGE REQUIREMENTS**
- Observe manufacturer's storing and handling recommendations.

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

**EXPOSURE CONTROLS**

<table>
<thead>
<tr>
<th>Source</th>
<th>Material</th>
<th>TWA ppm</th>
<th>TWA mg/m³</th>
<th>STEL ppm</th>
<th>STEL mg/m³</th>
<th>Peak ppm</th>
<th>Peak mg/m³</th>
<th>TWA F/CC</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada - British Columbia Occupational Exposure Limits</td>
<td>zinc sulfide (Particles (Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC))</td>
<td>10 (N)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
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---

3 of 7
<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Limit(s)</th>
</tr>
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<tbody>
<tr>
<td>US - Wyoming</td>
<td>Toxic and Hazardous Substances, Table Z1 Limits for Air Contaminants</td>
<td>5</td>
</tr>
<tr>
<td>US - Tennessee</td>
<td>Occupational Exposure Limits - Limits For Air Contaminants</td>
<td>5</td>
</tr>
<tr>
<td>US - California</td>
<td>Permissible Exposure Limits for Chemical Contaminants</td>
<td>5</td>
</tr>
<tr>
<td>US - Oregon</td>
<td>Permissible Exposure Limits (Z-1)</td>
<td>5</td>
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<tr>
<td>Canada - Prince Edward Island</td>
<td>Occupational Exposure Limits</td>
<td>10</td>
</tr>
</tbody>
</table>

**Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits. PNOR means "particles not otherwise regulated."**

**ENDOELTABLE**

**PERSONAL PROTECTION**
RESPIRATOR
Particulate
Consult your EHS staff for recommendations

EYE
· Safety glasses with side shields.
· Chemical goggles.

HANDS/FEET
■ Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:
· frequency and duration of contact,
· chemical resistance of glove material,
· glove thickness and
· dexterity
Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).
· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
· Contaminated gloves should be replaced.
Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.
Wear chemical protective gloves, eg. PVC.

OTHER
· Overalls.
· P.V.C. apron.
· Barrier cream.
· Skin cleansing cream.
· Eye wash unit.

ENGINEERING CONTROLS
■ Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES
Solid.
Does not mix with water.
Sinks in water.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Divided solid</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>97.46</td>
</tr>
<tr>
<td>Melting Range (°F)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not Applicable</td>
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<tr>
<td>Boiling Range (°F)</td>
<td>2156 (sublimes)</td>
</tr>
<tr>
<td>Solubility in water (g/L)</td>
<td>Immiscible</td>
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<tr>
<td>Flash Point (°F)</td>
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<tr>
<td>pH (1% solution)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Decomposition Temp (°F)</td>
<td>Not available.</td>
</tr>
<tr>
<td>pH (as supplied)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Autoignition Temp (°F)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapour Pressure (mmHG)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Upper Explosive Limit (%)</td>
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<tr>
<td>Specific Gravity (water=1)</td>
<td>3.98-4.102</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Relative Vapor Density (air=1)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Volatile Component (%vol)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

APPEARANCE
White fine powder; sometimes with a yellowish cast. Insoluble in water. Exists in two crystalline forms, alpha (wurtzite) and beta (sphalerite). Changes to alpha form at 1020C. Soluble in and decomposed by acids.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY
· Presence of incompatible materials.
· Product is considered stable.

STORAGE INCOMPATIBILITY
· WARNING: Avoid or control reaction with peroxides. All transition metal peroxides should be considered as potentially explosive. For example transition metal complexes of alkyl hydroperoxides may decompose explosively.
· The π-complexes formed between chromium(0), vanadium(0) and other transition metals (haloarene-metal complexes) and mono-or poly-fluorobenzene show extreme sensitivity to heat and are explosive.
· Avoid reaction with borohydrides or cyanoborohydrides.
· Sulfides are incompatible with acids, diazo and azo compounds, halocarbons, isocyanates, aldehydes, alkali metals, nitrides, hydrides, and other strong reducing agents.
· Many reactions of sulfides with these materials generate heat and in many cases hydrogen gas.
· Many sulfide compounds may liberate hydrogen sulfide upon reaction with an acid.
· Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.
· These trifluorides are hypergolic oxidisers. They ignite on contact (without external source of heat or ignition) with recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition.
· The state of subdivision may affect the results.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

zinc sulfide

TOXICITY AND IRRITATION
ZINC SULFIDE:
■ No significant acute toxicological data identified in literature search.

Section 12 - ECOLOGICAL INFORMATION

Very toxic to aquatic organisms.
This material and its container must be disposed of as hazardous waste.
Avoid release to the environment.
Refer to special instructions/ safety data sheets.

Ecotoxicity

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
<th>Bioaccumulation</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>zinc sulfide</td>
<td>LOW</td>
<td></td>
<td></td>
<td>LOW</td>
</tr>
</tbody>
</table>

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions
All waste must be handled in accordance with local, state and federal regulations.
Legislation addressing waste disposal requirements may differ by country, state and/or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
A Hierarchy of Controls seems to be common - the user should investigate:
· Reduction
· Reuse
· Recycling
· Disposal (if all else fails)
This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.
DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.
· Recycle wherever possible or consult manufacturer for recycling options.
· Consult Waste Management Authority for disposal.

Section 14 - TRANSPORTATION INFORMATION

DOT:
Symbols: G Hazard class or Division: 9
Identification Numbers: UN3077 PG: III
Label Codes: 9 Special provisions: 8, 146, 335, B54, IB8, IP3, N20, T1, TP33
Packaging: Exceptions: 155 Packaging: Non- bulk: 213
Packaging: Exceptions: 155 Quantity limitations: No limit
Passenger aircraft/rail:
Quantity Limitations: Cargo No limit Vessel stowage: Location: A
Vessel stowage: Other: None
Hazardous materials descriptions and proper shipping names:
Environmentally hazardous substance, solid, n.o.s

Air Transport IATA:
ICAO/IATA Class: 9 ICAO/IATA Subrisk: None
UN/ID Number: 3077 Packing Group: III
Special provisions: A97
Cargo Only
Packing Instructions: 400 kg Maximum Qty/Pack: 400 kg
Passenger and Cargo Passenger and Cargo
Packing Instructions: 956 Maximum Qty/Pack: 956
Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity
Packing Instructions: 30 kg G Maximum Qty/Pack: Y956
Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. *(CONTAINS ZINC SULFIDE)

Maritime Transport IMDG:
IMDG Class: 9 IMDG Subrisk: None
UN Number: 3077 Packing Group: III
EMS Number: F-A , S-F Special provisions: 179 274 335 909
Limited Quantities: 5 kg Marine Pollutant: Yes
Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. *(contains zinc sulfide)

Section 15 - REGULATORY INFORMATION

zinc sulfide (CAS: 1314-98-3) is found on the following regulatory lists;

Section 16 - OTHER INFORMATION

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Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references. A list of reference resources used to assist the committee may be found at: www.chemwatch.net/references.

The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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