Thiabendazole

sc-204913

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Thiabendazole

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

SYNONYMS

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>1</td>
<td></td>
</tr>
<tr>
<td>Toxinity:</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Body Contact:</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Reactivity:</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Chronic:</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

CANADIAN WHMIS SYMBOLS
None

EMERGENCY OVERVIEW
RISK
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
- Accidental ingestion of the material may be damaging to the health of the individual.
- Benzimidazole carbamate anthelmintics, when administered in therapeutic doses, have produced allergic reaction (which may be associated with destruction of parasites), raised liver enzyme values, and may be associated with leukopenia and alopecia. Extremely large oral doses may produce intestinal cramps, anorexia, lethargy, pulmonary haemorrhage, oedema, hepatic and epicardial haemorrhage, and nausea, vomiting and diarrhoea. Other symptoms include dizziness, giddiness, tinnitus, insomnia, anxiety, confusion, convulsions, hallucinations and headache. Overdose may produce gastrointestinal symptoms, visual disturbance and psychic alterations. Absorption is generally limited. Animal studies suggest that this family of drugs may also be teratogenic.

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 either adverse health effects or irritation of the respiratory tract following inhalation (as classified using animal models). Nevertheless, adverse effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

CHRONIC HEALTH EFFECTS
- There is some evidence that human exposure to the material may result in developmental toxicity. This evidence is based on animal studies where effects have been observed in the absence of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not secondary non-specific consequences of the other toxic effects. 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.

Repeated or prolonged exposure to low doses of thiabendazole appear to have no adverse effect on reproductive functions. Reproduction and teratogenicity studies done in the rabbit, mouse and rat at doses 15 and 2.5 times respectively the usual human dose revealed no harm to the foetus. In some developmental toxicity studies in rats and rabbits, decreased foetal weights and resorptions were observed but only where maternal toxicity was indicated. Cleft palate and skeletal effects were produced in mice given 10 times the human dose. There are some studies where animals given high doses for prolonged periods of time developed a mild persistent anaemia and slight liver damage. Thiabendazole was tested in 2-year rat and dog studies and was found to be non-carcinogenic. It has tested negative in several mutagenicity tests. An increased incidence of benign thyroid adenomas were noted in a 2-year study in rats. This increase was considered to be secondary to a compound-related increase in thyroid stimulating hormone. In repeat dose oral toxicity studies in rats and dogs, alopecia (hair loss), mild persistent anaemia, and changes in the thyroid, liver, spleen, kidney and gall bladder were observed. The no-observed-adverse effect level (NOAEL) for all changes listed is 10 mg/kg/day. Thiabendazole is reported to delay theophylline metabolism.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>NAME</th>
<th>CAS RN</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>thiabendazole</td>
<td>148-79-8</td>
<td>&gt;98</td>
</tr>
</tbody>
</table>

Section 4 - FIRST AID MEASURES

SWALLOWED
- 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
- Treat symptomatically.
- Pre-existing liver or kidney disease may be aggravated by exposure.

<table>
<thead>
<tr>
<th>Section 5 - FIRE FIGHTING MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vapour Pressure (mmHG):</td>
</tr>
<tr>
<td>Upper Explosive Limit (%):</td>
</tr>
<tr>
<td>Specific Gravity (water=1):</td>
</tr>
<tr>
<td>Lower Explosive Limit (%):</td>
</tr>
</tbody>
</table>

EXTINGUISHING MEDIA
- Foam.
- Dry chemical powder.

FIRE FIGHTING
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
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
- Combustible solid which burns but propagates flame with difficulty.
- Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.
Combustion products include: carbon monoxide (CO), carbon dioxide (CO2), nitrogen oxides (NOx), sulfur oxides (SOx), other pyrolysis products typical of burning organic material.
Dust explosion data:
for thiabendazole microfine (2-90831) (Merck, Sharp and Dohme)
Maximum Explosion Overpressure: \( P_{\text{max}} = 8.8 \text{ bar} \)
Maximum Pressure Rate Rise: \( \frac{dP}{dt}_{\text{max}} = 1008 \text{ bar/s} \)
Specific Material Constant: \( K_s = 274 \text{ mbar/s} \)

FIRE INCOMPATIBILITY
- Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

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

<table>
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<tr>
<th>Section 6 - ACCIDENTAL RELEASE MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINOR SPILLS</td>
</tr>
</tbody>
</table>
- 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.
Environmental hazard - contain spillage.
MAJOR SPILLS
- Environmental hazard - contain spillage.
Moderate hazard.
- CAUTION: Advise personnel in area.
- Alert Emergency Responders and tell them location and nature of hazard.

<table>
<thead>
<tr>
<th>Section 7 - HANDLING AND STORAGE</th>
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<tbody>
<tr>
<td>PROCEDURE FOR HANDLING</td>
</tr>
</tbody>
</table>
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.
- Do NOT cut, drill, grind or weld such containers.
· In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

**RECOMMENDED STORAGE METHODS**
- Glass container.
- 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**
The following materials had no OELs on our records
- thiabendazole: CAS:148-79-8

**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.
- Impervious, gauntlet length gloves. Safety footwear.

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

**ENGINEERING CONTROLS**
- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
- Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

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### Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

**PHYSICAL PROPERTIES**
Solid.
Does not mix with water.

<table>
<thead>
<tr>
<th>State</th>
<th>Divided solid</th>
<th>Molecular Weight</th>
<th>Viscosity</th>
<th>Not available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting Range (°F)</td>
<td>566.6- 572</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Boiling Range (°F)
Not applicable.

### Flash Point (°F)
Not available.

### Decomposition Temp (°F)
Not available.

### Autoignition Temp (°F)
Not available.

### Upper Explosive Limit (%)
Not available.

### Lower Explosive Limit (%)
Not available.

### Solubility in water (g/L)
Partly miscible

### pH (1% solution)
4.75-7.5

### pH (as supplied)
Not available

### Vapour Pressure (mmHG)
Negligible

### Upper Explosive Limit (%)
Not available

### Lower Explosive Limit (%)
Not available

### Volatile Component (%vol)
Negligible

### Appearance
Off-white to tan to yellowish tan crystalline powder; does not mix well with water (pH 5: 0.03 mg/ml; pH 7: 0.028 mg/ml; pH 9: 0.028 mg/ml). Slightly soluble in ethanol and chlorinated hydrocarbons. Soluble in dimethylformamide.

### Section 10 - CHEMICAL STABILITY

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

#### STORAGE INCOMPATIBILITY
- Avoid reaction with oxidizing agents.

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

### Section 11 - TOXICOLOGICAL INFORMATION

#### Thiabendazole

#### TOXICITY AND IRRITATION

**thiabendazole**

**TOXICITY**

<table>
<thead>
<tr>
<th>Route</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral (rat) LD50</td>
<td>3100 mg/kg</td>
</tr>
<tr>
<td>Oral (mouse) LD50</td>
<td>3600 mg/kg</td>
</tr>
<tr>
<td>Oral (rabbit)</td>
<td>3850 mg/kg</td>
</tr>
<tr>
<td>Dermal (rabbit)</td>
<td>2000 mg/kg</td>
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**IRRITATION**

<table>
<thead>
<tr>
<th>Route</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin (rabbit)</td>
<td>Non-irritating</td>
</tr>
<tr>
<td>Skin (g.pig)</td>
<td>Non-sensitising</td>
</tr>
<tr>
<td>Eye (rabbit)</td>
<td>Non-irritating</td>
</tr>
<tr>
<td>Eye (rabbit)</td>
<td>Non-irritating</td>
</tr>
<tr>
<td>to abraded and intact</td>
<td></td>
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</tbody>
</table>

**ADI**

<table>
<thead>
<tr>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>0.3 mg/kg/day</td>
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**NOEL**

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 mg/kg/day</td>
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</table>

#### CARCINOGEN

**US Environmental Defense Scorecard**

<table>
<thead>
<tr>
<th>Thiabendazole</th>
<th>Suspected Carcinogens</th>
<th>Reference(s)</th>
<th>OPP-CAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

#### Section 12 - ECOLOGICAL INFORMATION

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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**

**GESAMP/EHS COMPOSITE LIST - GESAMP Hazard Profiles**

| Name / EHS TRN A1a A1b A2 A3 B1 B2 C1 C2 C3 D1 D2 D3 E1 E2 E3 Cas No / RTECS No | Polya(2+)c 224 574 4 4 4 NR (4) Nl (1) (1) (2) (1) (1) CM S 3 ycli c 6 aromatics / CAS:148- 79- 8 | |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------|

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.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

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 aircraft only:
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: 911 Maximum Qty/Pack: 400 kg
Passenger and Cargo Passenger and Cargo
Packing Instructions: 911 Maximum Qty/Pack: 400 kg
Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity
Packing Instructions: Y911 Maximum Qty/Pack: 30 kg G
Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. *(CONTAINS THIABENDAZOLE)

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 thiabendazole)
Section 15 - REGULATORY INFORMATION

thiabendazole (CAS: 148-79-8) is found on the following regulatory lists;
"Canada Non-Domestic Substances List (NDSL)"."US EPCRA Section 313 Chemical List"."US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act"."US Toxic Substances Control Act (TSCA) - Inventory"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

■ Ingestion may produce health damage*.
■ May be harmful to the foetus/embryo*.
* (limited evidence).

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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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