Thio-TEPA

Material Safety Data Sheet

sc-253693

Hazard Alert Code Key:
EXtreme HIGH MODERATE LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Thio-TEPA

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
C6-H12-N3-P-S, "aziridine, 1, 1, 1" "-phosphinothiolidynetris-", "1, 1', 1" "-phosphinothiolidynetsaziridine", "phosphoric tri(ethyleneimide), "phosphorothioic acid triethylenetriamine", "phosphorothioic triamide, N, N', N" '-tri-1, 2-ethanediyl-, "phosphorothioic triamide, N, N', N" '-triethylene-", thiophosphamide, "thiophosphoramidine, N, N', N" '-tri-1, 2-ethanediyl-, "thiophosphoramidine, N,N', N" '-triethylene-, thio-tep, thiotepa, "thiotepa S", thiotriethylene phosphoramidine, "triaziridinylphosphine sulfide", "N, N' N" '-tri-1, 2-ethanediylphosphorothioic triamide", "N, N', N" '-tri-1, 2-ethanediylthiophosphoramidine", tri(ethyleneimino)thiophosphoramide, "N, N', N" '-triethylene-thiophosphorothioic triamide", "triethylene thiophosphoramidine", triethylene thiophosphoramide, "N, N', N" '-triethylene thiophosphorotriamide", triethylenetriphosphorotriamide, "tris(1-aziridinyl)phosphine sulphide", tris(ethyleneimino)thiophosphate, SKE-6882, Stepa, Tespa, Tespamin, Tespamine, Thiofizil, Thiofet, Tifosyl, Tifosfamid, Tifosyl, Tiofizil, "To Tef", TSRA, WR-45312, CBC-806495, Girostan, Ledertepa, NCI-C01649, NSC-6396, Oncotepa, Oncothio-Tepa, Oncothiotepa, "antineoplastic/ cytotoxic"

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>Toxicity</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Body Contact</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Reactivity</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Chronic</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

CANADIAN WHMIS SYMBOLS

Min/Ni=0
Low=1
Moderate=2
High=3
Extreme=4
EMERGENCY OVERVIEW
RISK
Heating may cause an explosion.
May cause CANCER.
May cause heritable genetic damage.
Possible risk of harm to the unborn child.
Very toxic in contact with skin and if swallowed.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
- Severely toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 5 gram may be fatal or may produce serious damage to the health of the individual.
- The killing action of antineoplastic drugs used for cancer chemotherapy is not selective for cancerous cells alone but affect all dividing cells.
Acute side effects include loss of appetite, nausea and vomiting, allergic reaction (skin rash, itch, redness, low blood pressure, unwellness and anaphylactic shock) and local irritation.

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
- Skin contact with the material may produce severely toxic effects; systemic effects may result following absorption and these may be fatal.
- The material is not thought to be a skin irritant (as classified using animal models).
- Abrasive damage however, may result from prolonged exposures.
- Open cuts, abraded or irritated skin should not be exposed to this material.
- 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 respiratory irritation (as classified using animal models).
Nevertheless inhalation of dusts, or fume, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
- Inhalation of vapors, aerosols (mists, fumes) or dusts, generated by the material during the course of normal handling, may produce serious damage to the health of the individual.
- 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
- There is sufficient evidence to suggest that this material directly causes cancer in humans.
Based on experiments and other information, there is ample evidence to presume that exposure to this material can cause genetic defects that can be inherited.
Results in experiments suggest that this material may cause disorders in the development of the embryo or fetus, even when no signs of poisoning show in the mother.
There is limited evidence that, skin contact with this product is more likely to cause a sensitization reaction in some persons compared to the general population.
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.
Anti-cancer drugs used for chemotherapy can depress the bone marrow with reduction in the number of white blood cells and platelets and bleeding. Susceptibility to infections and bleeding is increased, which can be life-threatening.
Alkylating agents may damage the stem cell which acts as the precursor to components of the blood. Loss of the stem cell may result in pancytopenia (a reduction in the number of red and white blood cells and platelets) with a latency period corresponding to the lifetime of the individual blood cells. Granulocytopenia (a reduction in granular leukocytes) develops within days and thrombocytopenia (a disorder involving platelets), within 1-2 weeks, whilst loss of erythrocytes (red blood cells) needs months to become clinically manifest. Aplastic anaemia develops due to complete destruction of the stem cells. As with other alkylating agents this substance is potentially mutagenic, teratogenic and carcinogenic.
At therapeutic doses of 0.3-0.4 mg/kg I.V., adverse reactions included bone marrow depression, nausea, vomiting, loss of appetite, dizziness, headache and anaemia. Death from septicaemia and hemorrhage has occurred as a direct result of depression of bone marrow by thiotepa.
When administered by intraperitoneal injection thiotepa induced lung adenomas and lymphomas or lymphocytic leukaemia in mice of both sexes and squamous cell carcinomas of the skin and associated glands in male mice. Intraperitoneal or intravenous injection induced squamous cell carcinomas of the skin or ear canal in rats of both sexes and haematopoietic neoplasms in male rats.
An association has been suggested between the incidence of acute leukaemia and the therapeutic treatment with thiotepa alone or in combination with irradiation or other chemotherapeutic agents.
Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>NAME</th>
<th>CAS RN</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>thiotepa</td>
<td>52-24-4</td>
<td>&gt;98</td>
</tr>
</tbody>
</table>

Section 4 - FIRST AID MEASURES

SWALLOWED
- IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY. - Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:

EYE
- If this product comes in contact with the eyes: - Immediately hold eyelids apart and flush the eye continuously with 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: - Immediately flush body and clothes with large amounts of water, using safety shower if available. - Quickly remove all contaminated clothing, including footwear.

INHALED
- If fumes or combustion products are inhaled remove from contaminated area. - Lay patient down. Keep warm and rested.

NOTES TO PHYSICIAN
- Treat symptomatically.
- For employees potentially exposed to antineoplastic and/or cytotoxic agents on a regular basis, a preplacement physical examination and history (noting risk factors) is recommended. Periodic follow-up examinations should also be undertaken and should be overseen by a physician familiar with the toxic effects of the substance and full details of the nature of work undertaken by the employee.
- No specific antidote to thiotepa intoxication exists. However, monitoring hemograms and WBC counts is recommended to assess the level of intoxication to the haemopoietic system. Generally, if oral exposure occurs, induction of vomiting produces only a mean recovery of 30% of the ingested dose but it is still probably useful. Save initial emesis for analysis of thiotepa.

Section 5 - FIRE FIGHTING MEASURES

<table>
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<tr>
<th>Parameter</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Vapour Pressure (mmHG)</td>
<td>Negligible</td>
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<tr>
<td>Upper Explosive Limit (%)</td>
<td>Not available</td>
</tr>
<tr>
<td>Specific Gravity (water=1)</td>
<td>Not available</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not available</td>
</tr>
</tbody>
</table>

EXTINGUISHING MEDIA
- Water
- Foam
- Dry Chemical
- Do NOT use carbon dioxide.

FIRE FIGHTING
- Alert Emergency Responders and tell them location and nature of hazard.
- May be violently or explosively reactive.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS
- WARNING: May EXPLODE on heating!!!.
- 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), phosphorus oxides (POx), sulfur oxides (SOx), other pyrolysis products typical of burning organic material.
- May emit poisonous fumes.
- Capable of explosive decomposition when heated above 40 deg.C.

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

PERSONAL PROTECTION
- Glasses:
- Gloves:
- Respirator:
- Particulate

Section 6 - ACCIDENTAL RELEASE MEASURES
MINOR SPILLS
- Clean up waste regularly and abnormal spills immediately.
- Avoid breathing dust and contact with skin and eyes.
- Wear protective clothing, gloves, safety glasses and dust respirator.
- Use dry clean up procedures and avoid generating dust.
- Vacuum up or sweep up. NOTE: Vacuum cleaner must be fitted with an exhaust micro filter (HEPA type) (consider explosion-proof machines designed to be grounded during storage and use).
- Dampen with water to prevent dusting before sweeping.
- Place in suitable containers for disposal.

It is recommended that areas handling final finished product have cytotoxic spill kits available.

Spill kits should include:
- impermeable body covering,
- shoe covers,
- latex and utility latex gloves,
- goggles,
- approved HEPA respirator,
- disposable dust pan and scoop,
- absorbent towels,
- spill control pillows,
- disposable sponges,
- sharps container,
- disposable garbage bag and
- hazardous waste label.

To avoid accidental exposure due to waste handling of cytotoxics:
- Place waste residue in a segregated sealed plastic container.
- Used syringes, needles and sharps should not be crushed, clipped, recapped, but placed directly into an approved sharps container.
- Dispose of any cleanup materials and waste residue according to all applicable laws and regulations e.g, secure chemical landfill disposal.

MAJOR SPILLS
- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING
- The National Institute of Health (USA) recommends that the preparation of injectable antineoplastic drugs should be performed in a Class II laminar flow biological safety cabinet and that personnel preparing drugs of this class should wear appropriate personal protective gear. Emphasise controls on containment.
- 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
- Store in a dark glass or other suitable light resistant container.
- Lined metal can, Lined metal pail/drum
- Plastic pail.
- For low viscosity materials
- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.

STORAGE REQUIREMENTS
- Antineoplastics (cytotoxics):
  - should be clearly identifiable to all personnel involved in their handling
  - should be stored in impervious break-resistant containers.
  - Store in original containers.
  - Keep containers securely sealed.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

PERSONAL PROTECTION
RESPIRATOR
Particulate
Consult your EHS staff for recommendations

EYE
- Chemical protective goggles with full seal
- Shielded mask (gas-type)
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET
- Elbow length PVC gloves.

NOTE: The material may produce skin sensitization in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

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.

- Rubber gloves (nitrile or low-protein, powder-free latex). Employees allergic to latex gloves should use nitrile gloves in preference.
- Double gloving should be considered.
- PVC gloves.
- Protective shoe covers.
- Head covering.

OTHER
- Employees working with confirmed human carcinogens should be provided with, and be required to wear, clean, full body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers and gloves prior to entering the regulated area.
- Employees engaged in handling operations involving carcinogens should be provided with, and required to wear and use half-face filter-type respirators with filters for dusts, mists and fumes, or air purifying canisters or cartridges. A respirator affording higher levels of protection may be substituted.
- Emergency deluge showers and eyewash fountains, supplied with potable water, should be located near, within sight of, and on the same level with locations where direct exposure is likely.
- Prior to each exit from an area containing confirmed human carcinogens, employees should be required to remove and leave protective clothing and equipment at the point of exit and before engaging in other activities not associated with the isolated system. The contents of such impervious containers must be identified with suitable labels. For maintenance and decontamination activities, authorized employees entering the area should be provided with and required to wear clean, impervious garments, including gloves, boots and continuous-air supplied hood.
- Prior to removing protective garments the employee should undergo decontamination and be required to shower upon removal of the garments and hood.
- When handling antineoplastic materials, it is recommended that a disposal work-uniform (such as Tyvek or closed front surgical-type gown with knit cuffs) is worn.
- For quantities up to 500 grams a laboratory coat may be suitable.
- For quantities up to 1 kilogram a disposable laboratory coat or coverall of low permeability is recommended. Coveralls should be buttoned at collar and cuffs.
- For quantities over 1 kilogram and manufacturing operations, wear disposable coverall of low permeability and disposable shoe covers.
- For manufacturing operations, air-supplied full body suits may be required for the provision of advanced respiratory protection.
- Eye wash unit.
- Ensure there is ready access to an emergency shower.
- For Emergencies: Vinyl suit.

ENGINEERING CONTROLS
- Employees exposed to confirmed human carcinogens should be authorized to do so by the employer, and work in a regulated area.
- Work should be undertaken in an isolated system such as a "glove-box". Employees should wash their hands and arms upon completion of the assigned task and before engaging in other activities not associated with the isolated system.
Within regulated areas, the carcinogen should be stored in sealed containers, or enclosed in a closed system, including piping systems, with any sample ports or openings closed while the carcinogens are contained within.

- Open-vessel systems are prohibited.
- Each operation should be provided with continuous local exhaust ventilation so that air movement is always from ordinary work areas to the operation.
- Exhaust air should not be discharged to regulated areas, non-regulated areas or the external environment unless decontaminated. Clean make-up air should be introduced in sufficient volume to maintain correct operation of the local exhaust system.
- For maintenance and decontamination activities, authorized employees entering the area should be provided with and required to wear clean, impervious garments, including gloves, boots and continuous-air-supplied hood. Prior to removing protective garments the employee should undergo decontamination and be required to shower upon removal of the garments and hood.
- Except for outdoor systems, regulated areas should be maintained under negative pressure (with respect to non-regulated areas).
- Local exhaust ventilation requires make-up air be supplied in equal volumes to replaced air.
- Laboratory hoods must be designed and maintained so as to draw air inward at an average linear face velocity of 150 feet/ min. with a minimum of 125 feet/ min. Design and construction of the fume hood requires that insertion of any portion of the employees body, other than hands and arms, be disallowed.

DO NOT heat

### Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

#### PHYSICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid</td>
<td></td>
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<tr>
<td>Mixes with water</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>Divided solid</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>189.22</td>
</tr>
<tr>
<td>Melting Range (°F)</td>
<td>124.7</td>
</tr>
<tr>
<td>Boiling Range (°F)</td>
<td>Not available</td>
</tr>
<tr>
<td>Flash Point (°F)</td>
<td>Not available</td>
</tr>
<tr>
<td>Decomposition Temp (°F)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Autoignition Temp (°F)</td>
<td>Not available</td>
</tr>
<tr>
<td>Upper Explosive Limit (%)</td>
<td>Not available</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not available</td>
</tr>
<tr>
<td>Volatile Component (%vol)</td>
<td>Negligible</td>
</tr>
<tr>
<td>APPEARANCE</td>
<td>Fine white, odourless crystalline flakes or powder; mixes with water (190 gm/l), alcohol 1:2), chloroform (1:2). At temperatures above 8 deg C. polymerises and becomes inactive. Decomposes explosively above 40 deg.C.</td>
</tr>
</tbody>
</table>

#### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

**WARNING:** Capable of explosive decomposition on contact with acidic substances or when heated above 40 deg.C.

### Section 10 - CHEMICAL STABILITY

**STORAGE INCOMPATIBILITY**

- Several derivatives of the highly reactive aziridine (a strained ring compound) show explosive instability. In the presence of acids these compounds may be chemically reactive and may be subject to aqueous auto-catalyzed exothermic polymerization, which may be violent if uncontrolled by dilution, slow addition or cooling. Avoid reaction with oxidizing agents.

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

### Section 11 - TOXICOLOGICAL INFORMATION

**thiotepa**

**TOXICITY AND IRRITATION**

**THIOTEPA:** unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

**TOXICITY**

<table>
<thead>
<tr>
<th>Route</th>
<th>Value</th>
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<tbody>
<tr>
<td>Intraperitoneal (rat)</td>
<td>LD50: 8 mg/kg</td>
</tr>
<tr>
<td>Intravenous (rat)</td>
<td>LD50: 9.4 mg/kg</td>
</tr>
<tr>
<td>Intraarterial (rat)</td>
<td>LD50: 8.75 mg/kg</td>
</tr>
<tr>
<td>Oral (mouse)</td>
<td>LD50: 38 mg/kg</td>
</tr>
<tr>
<td>Intraperitoneal (mouse)</td>
<td>LD50: 18 mg/kg</td>
</tr>
</tbody>
</table>

**IRRITATION**

<table>
<thead>
<tr>
<th>Route</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin (human)</td>
<td>2 mg/3w</td>
</tr>
</tbody>
</table>

6 of 8
Subcutaneous (mouse) LD50: 19.5 mg/kg
Intravenous (mouse) LD50: 14.5 mg/kg
Intramuscular (mouse) LD50: 11.5 mg/kg
Intravenous (monkey) LDLo: 2 mg/kg

Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).

NOTE: Substance has been shown to be mutagenic in at least one assay, or belongs to a family of chemicals producing damage or change to cellular DNA.

WARNING: This substance has been classified by the IARC as Group 1: CARCINOGENIC TO HUMANS.

Tenth Annual Report on Carcinogens: Substance known to be Carcinogenic [National Toxicology Program: U.S. Dep. of Health and Human Services 2002].

Dermal (-) LD50: 45 mg/kg
Effects on fertility, foetotoxicty, foetolethality, specific developmental abnormalities (musculoskeletal, central nervous system, craniofacial, body wall), paternal effects, leukaemia, skin tumours, lymphomas, respiratory tract tumours, ear tumours, paraesthesia, bone marrow changes recorded.

**CARCINOGEN**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>US - Rhode Island Hazardous Substance List</th>
<th>IARC</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRIS(1-AZIRIDINYL) PHOSPHINE SULFIDE (THIOTEPA)</td>
<td>US Environmental Defense Scorecard Recognized Carcinogens</td>
<td>Reference(s)</td>
<td>P65</td>
</tr>
<tr>
<td>TRIS(1-AZIRIDINYL) PHOSPHINE SULFIDE (THIOTEPA)</td>
<td>US Environmental Defense Scorecard Suspected Carcinogens</td>
<td>Reference(s)</td>
<td>P65</td>
</tr>
<tr>
<td>VPVB (VERY~</td>
<td>US - Maine Chemicals of High Concern List</td>
<td>Carcinogen</td>
<td>CA Prop 65; IARC; NTP 11th ROC</td>
</tr>
</tbody>
</table>

**Section 12 - ECOLOGICAL INFORMATION**
This material and its container must be disposed of as hazardous waste.

**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>thiopeta</td>
<td>HIGH</td>
<td></td>
<td>LOW</td>
<td>HIGH</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.

- Antineoplastic (cytotoxic) wastes must be packed directly, ready for incineration, into color-coded, secure, labelled, leak-proof containers sufficiently robust to withstand handling without breaking, bursting or leaking.
- Containers of special design are available for particular needs (such as disposal of sharps) and should be used.

**Section 14 - TRANSPORTATION INFORMATION**

**DOT:**
Symbols: None Hazard class or Division: 6.1
Identification Numbers: UN3249 PG: II
Label Codes: 6.1 Special provisions: T3, TP33
Packaging: Exceptions: 153 Packaging: Non- bulk: 212
Packaging: Exceptions: 153 Quantity limitations: 5 kg
Passenger aircraft/rail:
Quantity Limitations: Cargo 5 kg Vessel stowage: Location: C aircraft only:
Vessel stowage: Other: 40
Hazardous materials descriptions and proper shipping names:
Medicine, solid, toxic, n.o.s.

**Air Transport IATA:**
ICAO/IATA Class: 6.1 ICAO/IATA Subrisk: None
UN/ID Number: 3249 Packing Group: II
Special provisions: A3
Cargo Only
Packing Instructions: 5 kg Maximum Qty/Pack: 5 kg
Passenger and Cargo Passenger and Cargo
Packing Instructions: 615 Maximum Qty/Pack: 613
Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity
Packing Instructions: 1 kg Maximum Qty/Pack: Y613
Shipping Name: MEDICINE, SOLID, TOXIC, N.O.S.(CONTAINS THIOTEPA)

**Maritime Transport IMDG:**
IMDG Class: 6.1 IMDG Subrisk: None
UN Number: 3249 Packing Group: II
EMS Number: F-A, S-A Special provisions: 221
Limited Quantities: 500 g
Shipping Name: MEDICINE, SOLID, TOXIC, N.O.S.

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**Section 15 - REGULATORY INFORMATION**

**thiotepa (CAS: 52-24-4) is found on the following regulatory lists:**

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**Section 16 - OTHER INFORMATION**

**ND**
Substance CAS Suggested codes thiotepa 52-24-4 AUTOID~

**Germany** Hazard classification and labelling of medicines with antineoplastic effects (ATC Code L01 and L02)
INN CAS Danger CMR effects CMR effects Other
Cat 1&2 Cat 3
Thiotepa 52-24-4 T+ R 45 R 27/28

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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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