2-Iminothiolane, Hydrochloride

sc-209204

Hazard Alert Code
Key:

EXTREME  HIGH  MODERATE  LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
2-Iminothiolane, Hydrochloride

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
C4H8CINS, C4-H7-N-S.HCl, "2-thiolaniminine hydrochloride", "dihydro-2(3H)-thiophenimine hydrochloride", "Traut's Reagent"

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>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>0</td>
<td></td>
</tr>
</tbody>
</table>

CANADIAN WHMIS SYMBOLS

Min/Nli=0
Low=1
Moderate=2
High=3
Extreme=4
EMERGENCY OVERVIEW

RISK

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

- The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion".
  This is because of the lack of corroborating animal or human evidence.

EYE

- Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may cause transient discomfort characterised 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 by EC Directives 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.
- 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 by EC Directives using animal models).
  Nevertheless inhalation of the material, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
- The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models).
  Nevertheless inhalation of dusts, or fumes, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
- Inhalation of dusts, generated by the material during the course of normal handling, may be damaging 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.
  If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.
- Prolonged exposure may cause headache, nausea and ultimately loss of consciousness.

CHRONIC HEALTH EFFECTS

- Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised 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. Prime symptom is breathlessness; lung shadows show on X-ray.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>NAME</th>
<th>CAS RN</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-iminothiolane hydrochloride</td>
<td>4781-83-3</td>
<td>&gt;98</td>
</tr>
</tbody>
</table>

Section 4 - FIRST AID MEASURES

SWALLOWED
• Immediately give a glass of water.
• First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

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.
• Seek medical attention without delay; if pain persists or recurs seek medical attention.
• Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

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.
• Lay patient down. Keep warm and rested.
• Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
• Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

NOTES TO PHYSICIAN
■ Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

<table>
<thead>
<tr>
<th>Vapour Pressure (mmHG)</th>
<th>Negligible</th>
</tr>
</thead>
<tbody>
<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
• Foam.
• Dry chemical powder.
• BCF (where regulations permit).
• Carbon dioxide.

FIRE FIGHTING
• Alert Fire Brigade and tell them location and nature of hazard.
• Wear breathing apparatus plus protective gloves.
• Prevent, by any means available, spillage from entering drains or water courses.
• Use water delivered as a fine spray to control fire and cool adjacent area.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS
• Combustible solid which burns but propagates flame with difficulty; it is estimated that most organic dusts are combustible (circa 70%) - according to the circumstances under which the combustion process occurs, such materials may cause fires and / or dust explosions.
• 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 (420 micron or less) may burn rapidly and fiercely if ignited - particles exceeding this limit will generally not form flammable dust clouds.; once initiated, however, larger particles up to 1400 microns diameter will contribute to the propagation of an explosion.
• In the same way as gases and vapours, dusts in the form of a cloud are only ignitable over a range of
concentrations; in principle, the concepts of lower explosive limit (LEL) and upper explosive limit (UEL) are applicable to dust clouds but only the LEL is of practical use; this is because of the inherent difficulty of achieving homogeneous dust clouds at high temperatures (for dusts the LEL is often called the "Minimum Explosible Concentration", MEC)

- A dust explosion may release of large quantities of gaseous products; this in turn creates a subsequent pressure rise of explosive force capable of damaging plant and buildings and injuring people.

Combustion products include carbon monoxide (CO), carbon dioxide (CO2), hydrogen chloride, phosgene, nitrogen oxides (NOx), sulfur oxides (SOx), other pyrolysis products typical of burning organic material.

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

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.

MAJOR SPILLS
Moderate hazard.
- CAUTION Advise personnel in area.
- Alert Emergency Services and tell them location and nature of hazard.
- Control personal contact by wearing protective clothing.
- Prevent, by any means available, spillage from entering drains or water courses.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.

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

STORAGE REQUIREMENTS
- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry area protected from environmental extremes.
- Store away from incompatible materials and foodstuff containers.

Moisture-sensitive.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

<table>
<thead>
<tr>
<th>Source</th>
<th>Material</th>
<th>TWA</th>
<th>TWA</th>
<th>STEL</th>
<th>STEL</th>
<th>Peak</th>
<th>Peak</th>
<th>TWA</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Substance</td>
<td>Concentration</td>
<td>Unit</td>
<td>Other Notes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------------------------------</td>
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<td>----------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Canada - Ontario</strong> Occupational Exposure Limits</td>
<td>2-iminothiolane hydrochloride (Particles (Insoluble or Poorly Soluble) Not Otherwise)</td>
<td>10 (I)</td>
<td>ppm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Canada - British Columbia Occupational Exposure Limits</strong></td>
<td>2-iminothiolane hydrochloride (Particles (Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC))</td>
<td>10 (N)</td>
<td>ppm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Canada - Ontario Occupational Exposure Limits</strong></td>
<td>2-iminothiolane hydrochloride (Specified (PNOS) / Particules (insolubles ou peu solubles) non précisées par ailleurs)</td>
<td>3 (R)</td>
<td>ppm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants</strong></td>
<td>2-iminothiolane hydrochloride (Particulates not otherwise regulated Respirable fraction)</td>
<td>5</td>
<td>ppm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>US - California Permissible Exposure Limits for Chemical Contaminants</strong></td>
<td>2-iminothiolane hydrochloride (Particulates not otherwise regulated Respirable fraction)</td>
<td>5</td>
<td>ppm</td>
<td>(n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>US - Oregon Permissible Exposure Limits (Z-1)</strong></td>
<td>2-iminothiolane hydrochloride (Particulates not otherwise regulated (PNOR) (f) Total Dust)</td>
<td>- 10</td>
<td>ppm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>US - Michigan Exposure Limits for Air Contaminants</strong></td>
<td>2-iminothiolane hydrochloride (Particulates not otherwise regulated, Respirable dust)</td>
<td>5</td>
<td>ppm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>US - Oregon Permissible Exposure Limits (Z-1)</strong></td>
<td>2-iminothiolane hydrochloride (Particulates not otherwise regulated (PNOR) (f) Respirable Fraction)</td>
<td>- 5</td>
<td>ppm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></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.”**
US - Wyoming Toxic and Hazardous Substances Table
Z1 Limits for Air Contaminants

<table>
<thead>
<tr>
<th>Substance</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-iminothiolane hydrochloride</td>
<td>5</td>
</tr>
</tbody>
</table>

PARTICULATE MATTER

PERSONAL PROTECTION

RESPIRATOR
- Particulate. (AS/NZS 1716 & 1715, EN 1432000 & 1492001, ANSI Z88 or national equivalent)

EYE
- Safety glasses with side shields
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses 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], [AS/NZS 1336 or national equivalent]

HANDS/FEET
Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include
- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
dexterity
Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.
- polychloroprene
- nitrile rubber
- butyl rubber
- fluorocaoutchouc

OTHER
- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.

ENGINEERING CONTROLS
Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard “physically” away from the worker
and ventilation that strategically "adds" and "removes" air in the work environment.

### Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

#### PHYSICAL PROPERTIES

Solid. 
Does not mix with water.

<table>
<thead>
<tr>
<th>State</th>
<th>Divide solid</th>
<th>Molecular Weight</th>
<th>137.60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting Range (°F)</td>
<td>388-394</td>
<td>Viscosity</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Boiling Range (°F)</td>
<td>Not available</td>
<td>Solubility in water (g/L)</td>
<td>Partly miscible</td>
</tr>
<tr>
<td>Flash Point (°F)</td>
<td>Not available</td>
<td>pH (1% solution)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Decomposition Temp (°F)</td>
<td>Not available</td>
<td>pH (as supplied)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Autoignition Temp (°F)</td>
<td>Not available</td>
<td>Vapour Pressure (mmHG)</td>
<td>Negligible</td>
</tr>
<tr>
<td>Upper Explosive Limit (%)</td>
<td>Not available</td>
<td>Specific Gravity (water=1)</td>
<td>Not available</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not available</td>
<td>Relative Vapour Density (air=1)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Volatile Component (%vol)</td>
<td>Negligible</td>
<td>Evaporation Rate</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**APPEARANCE**

Powder with unpleasant odor; does not mix well with water.

### Section 10 - CHEMICAL STABILITY

#### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

#### STORAGE INCOMPATIBILITY

- Avoid reaction with oxidising agents

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

### Section 11 - TOXICOLOGICAL INFORMATION

2-iminothiolane hydrochloride

**TOXICITY AND IRRITATION**

- No significant acute toxicological data identified in literature search.

### Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

### 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. In most instances the supplier of the material should be consulted.
• DO NOT allow wash water from cleaning or process equipment to enter drains.
• It may be necessary to collect all wash water for treatment before disposal.
• In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
• Where in doubt contact the responsible authority.
• Recycle wherever possible.
• Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
• Dispose of by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or Incineration in a licenced apparatus (after admixture with suitable combustible material)
• Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

Section 14 - TRANSPORTATION INFORMATION

DOT:
Symbols: A G
Identification Numbers: UN3335
Label Codes: 9
Packaging: Exceptions: 155
Packaging: Exceptions: 155
Packaging: Non-bulk: 204
Special provisions: A35
Quantity limitations: No limit
Vessel stowage: Location: A

Hazardous materials descriptions and proper shipping names:
Aviation regulated solid, n.o.s.

Air Transport IATA:
ICAO/IATA Class: 9
UN/ID Number: 3335
Packing Group: -
Special provisions: A27
Cargo Only
Packing Instructions: 956
Passenger and Cargo
Packing Instructions: 956
Passenger and Cargo
Limited Quantity
Packing Instructions: Y956
Maximum Qty/Pack: 200 kg
Maximum Qty/Pack: 100 kg
Maximum Qty/Pack: 30 kg G

Shipping name: AVIATION REGULATED SOLID, N.O.S. (contains 2-iminothiolane hydrochloride)
NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: IMDG

Section 15 - REGULATORY INFORMATION
2-iminothiolane hydrochloride (CAS: 4781-83-3) is found on the following regulatory lists:
"Canada - Alberta Ambient Air Quality Guidelines","Canada - Alberta Ambient Air Quality Objectives","Canada - British Columbia Occupational Exposure Limits","Canada - Ontario Occupational Exposure Limits","Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)","Canada National Pollutant Release Inventory (NPRI)","US - California Permissible Exposure Limits for Chemical Contaminants","US - Michigan Exposure Limits for Air Contaminants","US - Oregon Permissible Exposure Limits (Z-1)","US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants","US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants","US Clean Air Act (CAA) National Ambient Air Quality Standards (NAAQS)"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

■ Inhalation may produce health damage*.
* (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.

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www.Chemwatch.net

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