

# Thiophene

sc-251237

## Material Safety Data Sheet



The Power to Question

Hazard Alert Code  
Key:

EXTREME

HIGH

MODERATE

LOW

### Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

#### PRODUCT NAME

Thiophene

#### STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

#### 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

C4-H4-S, thiofuran, thiofuram, thiophen, thiofurfuran, thiole, thiotetrole, thiocyclopentadiene, "divinylene sulfide", CP-34, "Huille H50"

### Section 2 - HAZARDS IDENTIFICATION

#### CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability	3		
Toxicity	2		
Body Contact	2		
Reactivity	1		
Chronic	2		

Min/Nil=0  
Low=1  
Moderate=2  
High=3  
Extreme=4



## CANADIAN WHMIS SYMBOLS



### EMERGENCY OVERVIEW

#### RISK

Harmful danger of serious damage to health by prolonged exposure if swallowed.

Harmful by inhalation and if swallowed.

Irritating to eyes, respiratory system and skin.

Highly flammable.

Harmful 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 harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

■ Considered an unlikely route of entry in commercial/industrial environments.

The liquid may produce gastrointestinal discomfort and may be harmful if swallowed.

##### EYE

■ This material can cause eye irritation and damage in some persons.

##### SKIN

■ This material can cause inflammation of the skin on contact in some persons.

■ The material may accentuate any pre-existing dermatitis condition.

■ 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

■ Inhalation of vapors or aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.

■ The material can cause respiratory irritation in some persons.

The body's response to such irritation can cause further lung damage.

■ Inhalation of vapours may cause drowsiness and dizziness.

This may be accompanied by narcosis, reduced alertness, loss of reflexes, lack of coordination and vertigo.

■ Thiophene concentrations below the odour threshold level (1-2.

1 mg/m<sup>3</sup>) produce light sensitivity of the human eye.

■ Inhalation of high concentrations of gas/vapor causes lung irritation with coughing and nausea, central nervous depression with headache and dizziness, slowing of reflexes, fatigue and inco-ordination.

#### CHRONIC HEALTH EFFECTS

■ Harmful danger of serious damage to health by prolonged exposure if swallowed.

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This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects.

Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Workers engaged in the synthesis of thiophenes show changes to the nervous system, the cardiovascular system and the liver. Thiophene produced tremor in animals after prolonged exposure.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
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**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

- 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 contact occurs

- Immediately remove all contaminated clothing, including footwear
- Flush skin and hair with running water (and soap if available).

**INHALED**

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

**NOTES TO PHYSICIAN**

- for poisons (where specific treatment regime is absent)

**BASIC TREATMENT**

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.

Treat symptomatically.

**Section 5 - FIRE FIGHTING MEASURES**

Vapor Pressure (mmHg)	139.511 @ 37.8 C
Upper Explosive Limit (%)	12.5
Specific Gravity (water=1)	1.051
Lower Explosive Limit (%)	1.5

**EXTINGUISHING MEDIA**

- Foam.
- Dry chemical powder.

**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 1000 metres in all directions.

**GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS**

- Liquid and vapor are highly flammable.
- Severe fire hazard when exposed to heat, flame and/or oxidizers.

Combustion products include carbon dioxide (CO<sub>2</sub>), sulfur oxides (SO<sub>x</sub>), hydrogen sulfide (H<sub>2</sub>S), other pyrolysis products typical of burning organic material.

**FIRE INCOMPATIBILITY**

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

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### **Section 6 - ACCIDENTAL RELEASE MEASURES**

#### **MINOR SPILLS**

- Remove all ignition sources.
- Clean up all spills immediately.

Treat with hypochlorite solution.

#### **MAJOR SPILLS**

Treat with hypochlorite solution.

- 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**

- Containers, even those that have been emptied, may contain explosive vapours.
- Do NOT cut, drill, grind, weld or perform similar operations on or near containers.
- DO NOT allow clothing wet with material to stay in contact with skin
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.

#### **RECOMMENDED STORAGE METHODS**

Packing as supplied by manufacturer. Plastic containers may only be used if approved for flammable liquid.

- For low viscosity materials (i) Drums and jerricans must be of the non-removable head type. (ii) Where a can is to be used as an inner package, the can must have a screwed enclosure.
- For materials with a viscosity of at least 2680 cSt. (23 deg. C)

#### **STORAGE REQUIREMENTS**

- Store in original containers in approved flame-proof area.
- No smoking, naked lights, heat or ignition sources.

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

#### **EXPOSURE CONTROLS**

The following materials had no OELs on our records

- thiophene CAS110-02-1

#### **PERSONAL PROTECTION**



#### RESPIRATOR

•Type AE-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 1432000 & 1492001, ANSI Z88 or national equivalent)

#### EYE

- Safety glasses with side shields.
- Chemical goggles.

#### HANDS/FEET

Wear chemical protective gloves, eg. PVC.

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

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).

- 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, AS/NZS 2161.10.1 or national equivalent) 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, AS/NZS 2161.10.1 or national equivalent) 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.

#### OTHER

- Overalls.
- PVC Apron.
- Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.
- For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets), non sparking safety footwear.

#### ENGINEERING CONTROLS

For flammable liquids and flammable gases, local exhaust ventilation or a process enclosure ventilation system may be required. Ventilation equipment should be explosion-resistant.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Liquid.

Does not mix with water.

Sinks in water.

State	Liquid	Molecular Weight	84.14
Melting Range (°F)	-36	Viscosity	Not Available
Boiling Range (°F)	184	Solubility in water (g/L)	Immiscible
Flash Point (°F)	30	pH (1% solution)	Not applicable
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable

Autoignition Temp (°F)	743	Vapor Pressure (mmHg)	139.511 @ 37.8 C
Upper Explosive Limit (%)	12.5	Specific Gravity (water=1)	1.051
Lower Explosive Limit (%)	1.5	Relative Vapor Density (air=1)	2.9
Volatile Component (%vol)	100	Evaporation Rate	Fast
Gas group	IIA		

thiophene

log Kow (Sangster 1997) 1.81

#### APPEARANCE

Liquid with benzene-like odour; does not mix with water. Miscible with most organic solvents.

log Kow 1.81 Terrestrial fate An estimated Koc value of 230, determined from an experimental log Kow of 1.81 indicates that thiophene is expected to have moderate mobility in soil Volatilisation of thiophene is expected from moist soil surfaces given an estimated Henry's Law constant of  $2.9 \times 10^{-3}$  atm-cu m/mole, determined from an experimental vapor pressure of 79.7 mm Hg at 25 deg C and water solubility of 3,020 mg/l at 25 deg C. Volatilisation from dry soil surfaces is expected based upon the vapor pressure of this compound.

Material	Value
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### Section 10 - CHEMICAL STABILITY

#### CONDITIONS CONTRIBUTING TO INSTABILITY

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

#### STORAGE INCOMPATIBILITY

Thiophene

- reacts violently with strong oxidisers, nitric acid, N-nitrosoacetanilide
- may generate electrostatic charges due to low conductivity
- Avoid contact with copper, aluminium and their alloys.

Avoid reaction with oxidizing agents.

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

### Section 11 - TOXICOLOGICAL INFORMATION

thiophene

#### TOXICITY AND IRRITATION

THIOPHENE

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

TOXICITY	IRRITATION
Oral (rat) LD50 1400 mg/kg	Nil Reported
Oral (mouse) LD50 420 mg/kg	
Inhalation (mouse) LC50 9500 mg/m <sup>3</sup> /2h	
Intraperitoneal (mouse) LD50 100 mg/kg	
Subcutaneous (rabbit) LD50 830 mg/kg	

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for

diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

## Section 12 - ECOLOGICAL INFORMATION

Harmful 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.

## Section 13 - DISPOSAL CONSIDERATIONS

### US EPA Waste Number & Descriptions

A. General Product Information

Ignitability characteristic: use EPA hazardous waste number D001 (waste code I)

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

‡ Puncture containers to prevent re-use and bury at an authorized landfill.

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. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. 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:	None	Hazard class or Division:	3
Identification Numbers:	UN2414	PG:	II
Label Codes:	3	Special provisions:	IB2, T4, TP1
Packaging: Exceptions:	150	Packaging: Non-bulk:	202
Packaging: Exceptions:	150	Quantity limitations: Passenger aircraft/rail:	5 L
Quantity Limitations: Cargo aircraft only:	60 L	Vessel stowage: Location:	B
Vessel stowage: Other:	40		

Hazardous materials descriptions and proper shipping names:

Thiophene

### Air Transport IATA:

UN/ID Number:	2414	Packing Group:	II
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Special provisions: None

#### Cargo Only

Packing Instructions:	364	Maximum Qty/Pack:	60 L
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Passenger and Cargo	Passenger and Cargo
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Packing Instructions:	Y341	Maximum Qty/Pack:	5 L
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Passenger and Cargo Limited Quantity	Passenger and Cargo Limited Quantity
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Packing Instructions:	353	Maximum Qty/Pack:	1 L
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Shipping Name: THIOPHENE

#### Maritime Transport IMDG:

IMDG Class:	3	IMDG Subrisk:	None
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UN Number:	2414	Packing Group:	II
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EMS Number:	F-E,S-D	Special provisions:	None
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Limited Quantities: 1 L

Shipping Name: THIOPHENE

### Section 15 - REGULATORY INFORMATION

**thiophene (CAS: 110-02-1) is found on the following regulatory lists;**

"Canada Domestic Substances List (DSL)", "US - Massachusetts Oil & Hazardous Material List", "US - New Jersey Right to Know Hazardous Substances", "US - Pennsylvania - Hazardous Substance List", "US EPA Master Testing List - Index I Chemicals Listed", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"

### Section 16 - OTHER INFORMATION

#### LIMITED EVIDENCE

- Cumulative effects may result following exposure\*.
- Vapours potentially cause drowsiness and dizziness\*.

\* (limited evidence).

#### Denmark Advisory list for selfclassification of dangerous substances

Substance	CAS	Suggested codes
thiophene	110- 02- 1	Xn; R22

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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](http://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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