

TBTC

sc-251105



The Power to Question

Material Safety Data Sheet

Hazard Alert Code
Key:

EXTREME

HIGH

MODERATE

LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

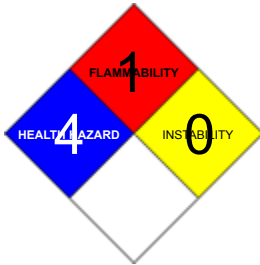
PRODUCT NAME

TBTC

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

C12-H27-Cl-Sn, (CH₃(CH₂)₃)₃SnCl, "stannane, tributylchloro-", chlorotributylstannane, chlorotributyltin, monochlorotributyltin, "tin, tri-n-butyl-, chloride", "tributylstannium chloride", tributylchlorotin, "tributylstannyl chloride", "tri-n-butyltin chloride", WR-3396

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

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



CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Harmful in contact with skin.

Toxic if swallowed.

Toxic danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

Irritating to eyes and skin.

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

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.

■ Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and esophagus.

■ Subchronic exposures to mono-, di- and tri- and tetra-substituted organotin compounds may elicit toxic response in the central nervous, immune and renal systems, the liver and bile duct and the skin.

■ Some trialkyl organotin compounds cause damage to the central nervous system, consisting of swelling through the white matter.

Lighter functional groups cause a more potent response.

EYE

■ There is evidence that material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation.

Severe inflammation may be expected with pain.

■ Organotin compounds may be strong irritants, and acute conjunctivitis may result from eye splashes, even when followed by immediate lavage; corneal opacities have also been observed.

■ Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns.

Mild burns of the epithelia generally recover rapidly and completely.

SKIN

■ Skin contact with the material may be harmful; systemic effects may result following absorption.

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

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

■ Irritation following contact with organotin compounds may be delayed, in certain cases chemical burns and dermatitis may result.

Rate of absorption may be increased if product is in solution.

■ Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue.

■ 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.

■ Trialkyl organotin compounds are well absorbed through the skin; healing is slow and skin burns result.

The lower abdomen, thighs and groin are most often affected due to absorption by clothing.

INHALED

■ Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may produce serious damage to the health of the individual.

■ 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.

■ Inhalation of quantities of liquid mist may be extremely hazardous, even lethal due to spasm, extreme irritation of larynx and bronchi, chemical pneumonitis and pulmonary edema.

- Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage.

There may be dizziness, headache, nausea and weakness.

- The acute toxicity of inhaled organotin compounds resembles that found by other means of exposure.

CHRONIC HEALTH EFFECTS

- Toxic danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

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.

Both tributyltins (TBT) and dibutyltins (DBT) have negative effects on the reproductive system in mammals. In line with these facts, TBT and TPT were given the highest category in a European review of endocrine disrupting chemicals (BKH, 2000) "Evidence for endocrine disruption in living organisms". TBT was also classified as "Evidence of potential to cause endocrine disruption in humans".

Organotins are also toxic by other mechanisms. For instance, several organotins are strongly immunosuppressive, display developmental and reproductive effects and are neurotoxic

TPT is classified as category 3 carcinogenic in the EU, but as category 2 (probable human carcinogenic) by the USEPA (EFSA, 2004). DBT may actually be more toxic than TBT to certain enzyme systems. Immunotoxic and developmental effects in mammals may also be more sensitive to DBT than to TB. Both TBT and TPT may be classified as Persistent, Bioaccumulative and Toxic (PBT) and very Persistent, very Bioaccumulative (vPvB) substances according to certain, whereas DBT and dioctyl tin (DO)T may be classified as PBT

For human health, there are no epidemiological studies on chronic low level exposure available. It has been suggested that toxicity was equal for DBT, TBT, DOT and TPT for humans, and proposed a group TDI of 0.1 µg Sn (kg Bw and d)-1.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
tributyltin chloride	1461-22-9	>98

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 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 acute or short term repeated exposures to strong acids
- Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
- Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling

Scanty animal data indicate that BAL may be useful against dialkyl but not trialkyl organotin compounds.

D-penicillamine is thought to be inactive.

Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG)	<0.0013 @ 20 C
Upper Explosive Limit (%)	Not available
Specific Gravity (water=1)	1.2
Lower Explosive Limit (%)	Not available

EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.

FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.

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

- Combustible.
- Slight fire hazard when exposed to heat or flame.

Combustion products include carbon dioxide (CO₂), hydrogen chloride, phosgene, metal oxides, other pyrolysis products typical of burning organic material.

May emit clouds of acrid smoke.

May emit poisonous fumes.

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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- Foam.
- Dry chemical powder.

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Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

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

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

- 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

Glass 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

- Store in original containers.
- Keep containers securely sealed.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC	Notes
US - Alaska Limits for Air Contaminants	tributyltin chloride (Tin oxide (as Sn))		2						
Canada - Northwest Territories Occupational Exposure Limits (English)	tributyltin chloride (Tin, inorganic compounds, except SnH and SnO (as Sn))		2		4				
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	tributyltin chloride (Tin, inorganic compounds, (as Sn) (except SnH ₄ and SnO ₂))	-	2	-	4				
US - Minnesota Permissible Exposure Limits (PELs)	tributyltin chloride (Tin, organic compounds (as Sn))		0.1						
US NIOSH Recommended Exposure Limits (RELs)	tributyltin chloride (Tin (organic compounds, as Sn))		0.1						[*Note The REL applies to all organic tin compounds except Cyhexatin.]; [skin]
US OSHA Permissible Exposure Levels	tributyltin chloride (Tin, organic compounds (as		0.1						

(PELs) - Table Z1	Sn))				
US - Idaho - Limits for Air Contaminants	tributyltin chloride (Tin (organic compounds) as (Sn))	0.1			
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	tributyltin chloride (Tin, organic compounds (as Sn))	0.1			
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	tributyltin chloride (Tin, organic compounds (as Sn))	0.1			
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	tributyltin chloride (Tin, organic compounds (as Sn))	0.1			
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	tributyltin chloride (Tin, (as Sn) organic compounds)	0.1	0.2		Skin
US - Washington Permissible exposure limits of air contaminants	tributyltin chloride (Tin (as Sn) - Organic compounds)	0.1	0.3		
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	tributyltin chloride (Tin, organic compounds (as Sn) - Skin)	- 0.1	- 0.2		
US - Hawaii Air Contaminant Limits	tributyltin chloride (Tin, organic compounds (as Sn))	0.1	0.2		
Canada - Nova Scotia Occupational Exposure Limits	tributyltin chloride (Tin - Organic compounds (as Sn))	0.1	0.2		
Canada - Northwest Territories Occupational Exposure Limits (English)	tributyltin chloride (Tin, organic4 compounds2 (as Sn) - Skin)	0.1	0.2		

US - Alaska Limits for Air Contaminants	tributyltin chloride (Tin, organic compounds (as Sn))	0.1		
Canada - British Columbia Occupational Exposure Limits	tributyltin chloride (Tin - Organic compounds, as Sn)	0.1	0.2	Skin
Canada - Alberta Occupational Exposure Limits	tributyltin chloride (Tin, as Sn Organic compounds)	0.1	0.2	
US - California Permissible Exposure Limits for Chemical Contaminants	tributyltin chloride (Tin, organic compounds, as Sn)	0.1	0.2	
Canada - Ontario Occupational Exposure Limits	tributyltin chloride (Organic compounds, as Sn / Composés organiques, en Sn)	0.1		Skin (organic compounds) / Peau (composés organiques)
US ACGIH Threshold Limit Values (TLV)	tributyltin chloride (Tin - Organic compounds (as Sn))	0.1	0.2	
Canada - Prince Edward Island Occupational Exposure Limits	tributyltin chloride (Tin - Organic compounds (as Sn))	0.1	0.2	
US - Oregon Permissible Exposure Limits (Z-1)	tributyltin chloride (Tin (organic compounds))	0.1		
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	tributyltin chloride (Tin Organic compounds (as Sn))	0.1	0.2	
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	tributyltin chloride (Tin, organic compounds (as Sn))	0.1		

PERSONAL PROTECTION



RESPIRATOR

•Type A 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.
- Eyewash 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

Liquid.

Does not mix with water.

Sinks in water.

Acid.

Toxic or noxious vapours/gas.

State	Liquid	Molecular Weight	325.51
Melting Range (°F)	Not available	Viscosity	Not Available
Boiling Range (°F)	340- 343 (25 mm)	Solubility in water (g/L)	Immiscible
Flash Point (°F)	>230	pH (1% solution)	Not applicable
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available	Vapour Pressure (mmHG)	<0.0013 @ 20 C
Upper Explosive Limit (%)	Not available	Specific Gravity (water=1)	1.2
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	>1.0
Volatile Component (%vol)	Not available	Evaporation Rate	Not available

APPEARANCE

Liquid with unpleasant odor; does not mix with water.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

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

STORAGE INCOMPATIBILITY

- Avoid strong acids, bases.
- Avoid reaction with oxidizing agents.

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

Section 11 - TOXICOLOGICAL INFORMATION

tributyltin chloride

TOXICITY AND IRRITATION

TRIBUTYLTIN CHLORIDE

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

TOXICITY	IRRITATION
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Oral (rat) LD50 129 mg/kg	Eye (rabbit) 0.05 mg/24h-SEVERE
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Oral (mouse) LD50 60 mg/kg	
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Oral (rabbit) LD50 0.03 mg/kg	
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The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

Effects on fertility, foetotoxicity, foetolethality, specific developmental abnormalities to the musculoskeletal system and behavioural effects on new-born reported.

CARCINOGEN

Tin - Organic compounds (as Sn)	US ACGIH Threshold Limit Values (TLV) - Carcinogens	Carcinogen Category	A4
tributyltin chloride	US - Rhode Island Hazardous Substance List	IARC	
TWAPPM~	US - Maine Chemicals of High Concern List	Carcinogen	A4
VPVB_VERY~	US - Maine Chemicals of High Concern List	Carcinogen	

SKIN

tributyltin chloride	US - Washington Permissible exposure limits of air contaminants - Skin	Skin	X
tributyltin chloride	US ACGIH Threshold Limit Values (TLV) - Skin	Skin Designation	Yes
tributyltin chloride	US AIHA Workplace Environmental Exposure Levels (WEELs) - Skin	Notes	
tributyltin chloride	US NIOSH Recommended Exposure Limits (RELs) - Skin	Skin	Yes
tributyltin chloride	US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Skin	Skin	X
tributyltin chloride	US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs) - Skin	Skin	X
tributyltin chloride	US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants - Skin	Skin Designation	X
tributyltin chloride	Canada - British Columbia Occupational Exposure Limits - Skin	Notation	Skin
tributyltin chloride	US - Minnesota Permissible Exposure Limits (PELs) - Skin	Skin Designation	X

tributyltin chloride	US - Hawaii Air Contaminant Limits - Skin Designation	Skin Designation	X
tributyltin chloride	US OSHA Permissible Exposure Levels (PELs) - Skin	Skin Designation	X
tributyltin chloride	US - Oregon Permissible Exposure Limits (Z2) - Skin	Skin	X
tributyltin chloride	US - California Permissible Exposure Limits for Chemical Contaminants - Skin	Skin	X
tributyltin chloride	US - California Permissible Exposure Limits for Chemical Contaminants - Skin	Skin	S
tributyltin chloride	Canada - Alberta Occupational Exposure Limits - Skin	Substance Interaction	1

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.

Section 13 - DISPOSAL CONSIDERATIONS

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 or consult manufacturer for recycling options.
- Consult Waste Management Authority for disposal.

Section 14 - TRANSPORTATION INFORMATION



DOT:

Symbols:	None	Hazard class or Division:	6.1
Identification Numbers:	UN2788	PG:	II

Label Codes:	6.1	Special provisions:	A3, IB2, N33, N34, T11, TP2, TP13, TP27
Packaging: Exceptions:	153	Packaging: Non-bulk:	202
Packaging: Exceptions:	153	Quantity limitations: Passenger aircraft/rail:	5 L
Quantity Limitations: Cargo aircraft only:	60 L	Vessel stowage: Location:	A
Vessel stowage: Other:	40	S.M.P.:	Severe

Hazardous materials descriptions and proper shipping names:

Organotin compounds, liquid, n.o.s.

Air Transport IATA:

UN/ID Number:	2788	Packing Group:	II
Special provisions:	A3		
Cargo Only			
Packing Instructions:	661	Maximum Qty/Pack:	60 L
Passenger and Cargo		Passenger and Cargo	
Packing Instructions:	Y641	Maximum Qty/Pack:	5 L
Passenger and Cargo Limited Quantity		Passenger and Cargo Limited Quantity	
Packing Instructions:	654	Maximum Qty/Pack:	1 L

Shipping Name: ORGANOTIN COMPOUND, LIQUID, N.O.S.

*(CONTAINS TRIBUTYL TIN CHLORIDE)

Maritime Transport IMDG:

IMDG Class:	6.1	IMDG Subrisk:	P
UN Number:	2788	Packing Group:	II
EMS Number:	F-A,S-A	Special provisions:	43 274
Limited Quantities:	100 ml	Marine Pollutant:	Yes

Shipping Name: ORGANOTIN COMPOUND, LIQUID, N.O.S.(contains tributyltin chloride)

Section 15 - REGULATORY INFORMATION

tributyltin chloride (CAS: 1461-22-9) is found on the following regulatory lists;

"Canada Domestic Substances List (DSL)","Canada Ingredient Disclosure List (SOR/88-64)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","International Chemical Secretariat (ChemSec) REACH SIN* List (*Substitute It Now!) 1.1","International Council of Chemical Associations (ICCA) - High Production Volume List","US - Maine Chemicals of High Concern List","US EPA High Production Volume Program Chemical List","US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

- Inhalation may produce serious health damage*.
- Cumulative effects may result following exposure*.
- May produce discomfort of the respiratory system*.

*(limited evidence).

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no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.

■ 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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