Benzotriazole

sc-210874

Material Safety Data Sheet

Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Benzotriazole

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
C6-H4-NHN2, C6-H5-N3, benzotriazole, "benzo triazole", benztriazole, "1, 2-aminozophenylene", amidobenzene, aziminobenzene, "benzene azimide", benzisotriazole, "2, 3-diazaindole", "1, 2, 3-triazaindene", "Cobratec #99", U-6233, Preventol, 24/R0247

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability:	3		
Toxicity:	3		
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 by inhalation, in contact with skin and if swallowed.
Irritating to eyes, respiratory system and skin.
Highly flammable.
Toxic to soil organisms.
May cause long-term adverse effects in the environment.
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.

EYE

■ This material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Moderate inflammation may be expected with redness; conjunctivitis may occur with prolonged exposure.

SKIN

■ Skin contact with the material may be harmful; systemic effects may resultfollowing absorption.
■ This material can cause inflammation of the skin oncontact 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 dusts, generated by the material, during the course of normalhandling, may be harmful.
■ The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.
■ 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

■ Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.
Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.
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.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
1H-benzotriazole	95-14-7	> 99

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):	0.398 hPa

Upper Explosive Limit (%):	Not available.
Specific Gravity (water=1):	1.36
Lower Explosive Limit (%):	2.4

EXTINGUISHING MEDIA

■ For SMALL FIRES:
Dry chemical, CO2, water spray or foam.
For LARGE FIRES:
Water-spray, fog or foam.

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

· Flammable solid which burns and propagates flame easily, even when partly wetted with water.
· Any source of ignition, i.e. friction, heat, sparks or flame, may cause fire or explosion.
Combustion products include: carbon monoxide (CO), carbon dioxide (CO_2), nitrogen oxides (NOx), other pyrolysis products typical of burning organic material.
CAUTION : May explode during vacuum distillation.

FIRE INCOMPATIBILITY

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

PERSONAL PROTECTION

Glasses:
Safety Glasses.
Chemical goggles.
Gloves:
Respirator:
Particulate dust filter.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
■ Environmental hazard - contain spillage.
· Remove all ignition sources.
· DO NOT touch or walk through spilled material.
MAJOR SPILLS
■ Environmental hazard - contain spillage.
· 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

· Avoid generation of static electricity. Earth all lines and equipment.
· Avoid all personal contact, including inhalation.
· Wear protective clothing when risk of overexposure occurs.
Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.
· Do NOT cut, drill, grind or weld such containers.
· In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

RECOMMENDED STORAGE METHODS

■ Glass container.
For low viscosity materials and solids: 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.

STORAGE REQUIREMENTS

■ FOR MINOR QUANTITIES:
· Store in an indoor fireproof cabinet or in a room of noncombustible construction
· Provide adequate portable fire-extinguishers in or near the storage area.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records

- CAS:95-14-7 CAS:25377-81-5 CAS:27556-51-0 CAS:28880-01-5 CAS:70644-74-5 CAS:94160-69-7 CAS:115773-98-3

1H-benzotriazole: CAS:116421-31-9 CAS:197463-08-4

PERSONAL PROTECTION




RESPIRATOR

BR2
Consult your EHS staff for recommendations

EYE

· Safety glasses with side shields.
· Chemical goggles.

HANDS/FEET

■ Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:
· frequency and duration of contact,
· chemical resistance of glove material,
· glove thickness and
· dexterity
Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).
· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
· Contaminated gloves should be replaced.
Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.
Wear physical protective gloves, eg. leather.

OTHER

· Overalls.
· Eyewash unit.
· 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 large scale or continuous use:
· Spark-free, earthed ventilation system, venting directly to the outside and separate from usual ventilation systems
· Provide dust collectors with explosion vents.
· Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
· Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Mixes with water.

State	DIVIDED SOLID	Molecular Weight	119.14
Melting Range (°F)	209.3	Viscosity	Not Applicable
Boiling Range (°F)	399.2 @ 1.99 kPa	Solubility in water (g/L)	Miscible
Flash Point (°F)	222.8 approx.	pH (1% solution)	5.5
Decomposition Temp (°F)	500	pH (as supplied)	Not Applicable
Autoignition Temp (°F)	752 approx.	Vapor Pressure (mmHg)	0.398 hPa
Upper Explosive Limit (%)	Not available.	Specific Gravity (water=1)	1.36
Lower Explosive Limit (%)	2.4	Relative Vapor Density (air=1)	4.1
Volatile Component (%vol)	Not available.	Evaporation Rate	Not Applicable

APPEARANCE

White to tan crystals; slight characteristic odour. Solubility in water 1.9% at 20 C. Soluble in alcohol, acetone, benzene, toluene, chloroform, DMF. Can exist in two tautomeric forms.

log Kow 1.34

Material	Value

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

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

STORAGE INCOMPATIBILITY

■ WARNING:
May decompose violently or explosively on contact with other substances.
· This substance is one of the relatively few compounds which are described as "endothermic" i.e. heat is absorbed into the compound, rather than released from it, during its formation.
· The majority of endothermic compounds are thermodynamically unstable and may decompose explosively under various circumstances of initiation.
· Many but not all endothermic compounds have been involved in decompositions, reactions and explosions and, in general, compounds with significantly positive values of standard heats of formation, may be considered suspect on stability grounds.
BRETHERICK L.: Handbook of Reactive Chemical Hazards.
Avoid reaction with oxidizing agents.

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

Section 11 - TOXICOLOGICAL INFORMATION

1H-BENZOTRIAZOLE

TOXICITY AND IRRITATION

1H-BENZOTRIAZOLE:
■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY	IRRITATION
Oral (rat) LDLo: 500 mg/kg	Skin (rabbit): slight *
Oral (rat) LD50: 700 mg/kg *	Eye (rabbit): Moderate *
Oral (rat) LD50: 560 mg/kg **	
Inhalation (Rat) LC50: 1910 mg/m³/3h	
Inhalation (Rat) LC50: 1400 mg/m³/4h ***	
Dermal (Rabbit) LD50: >10000 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.
The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
Bacterial mutagenicity: E. coli positive.
Ames positive; HGPRT negative; micronuclues test (mouse) negative ****
* [Ciba Geigy]
** [Bayer]
*** Merck
**** Benzotriazoles Coalition Synthetic Organic Chemical Manufacturers Association December, 2001

Section 12 - ECOLOGICAL INFORMATION

May cause long-term adverse effects in the environment.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Toxic to soil organisms.
This material and its container must be disposed of as hazardous waste.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
1H-benzotriazole	HIGH		LOW	MED

GESAMP/EHS COMPOSITE LIST - GESAMP Hazard Profiles

Name / EHS TRN A1a A1b A1 A2 B1 B2 C1 C2 C3 D1 D2 D3 E1 E2 E3 Cas No / RTECS No _____ ___ ___ ___ ___ ___ ___ ___ ___

___ ___ ___ ___ ___ ___ ___ ___ ___ Poly(2+)c 224 574 4 4 4 NR (4) NI (1) (1) (2) (1) (1) CM S 3 yclic 6 aromatics / CAS:95- 14- 7 /

Legend: EHS=EHS Number (EHS=GESAMP Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships) NRT=Net Register Tonnage, A1a=Bioaccumulation log Pow, A1b=Bioaccumulation BCF, A1=Bioaccumulation, A2=Biodegradation, B1=Acuteaquatic toxicity LC/ECIC50 (mg/l), B2=Chronic aquatic toxicity NOEC (mg/l), C1=Acute mammalian oral toxicity LD50 (mg/kg), C2=Acutemammalian dermal toxicity LD50 (mg/kg), C3=Acute mammalian inhalation toxicity LC50 (mg/kg), D1=Skin irritation & corrosion, D2=Eye irritation& corrosion, D3=Long-term health effects, E1=Tainting, E2=Physical effects on wildlife & benthic habitats, E3=Interference with coastal amenities, For column A2: R=Readily biodegradable, NR=Not readily biodegradable. For column D3: C=Carcinogen, M=Mutagenic, R=Reprotoxic, S=Sensitising, A=Aspiration hazard, T=Target organ systemic toxicity, L=Lunginjury, N=Neurotoxic, I=Immunotoxic. For column E1: NT=Not tainting (tested), T=Tainting test positive. For column E2: Fp=Persistent floater, F=Floater, S=Sinking substances. The numerical scales start from 0 (no hazard), while higher numbers reflect increasing hazard. (GESAMP/EHS Composite List of Hazard Profiles - Hazard evaluation of substances transported by ships)

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. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.
DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.
· Recycle wherever possible.
· Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

Section 14 - TRANSPORTATION INFORMATION

DOT:
Symbols: G Hazard class or Division: 4.1
Identification Numbers: UN2926 PG: II
Label Codes: 4.1, 6.1 Special provisions: A1, IB6,
IP2, T3,
TP33
Packaging: Exceptions: 151 Packaging: Non- bulk: 212
Packaging: Exceptions: 151 Quantity limitations: 15 kg
Passenger aircraft/rail:
Quantity Limitations: Cargo 50 kg Vessel stowage: Location: B
aircraft only:
Vessel stowage: Other: 40
Hazardous materials descriptions and proper shipping names:
Flammable solids, toxic, organic, n.o.s.

Air Transport IATA:

ICAO/IATA Class: 4.1 ICAO/IATA Subrisk: 6.1
UN/ID Number: 2926 Packing Group: II
Special provisions: A3
Cargo Only
Packing Instructions: 417 Maximum Qty/Pack: 50 kg
Passenger and Cargo Passenger and Cargo
Packing Instructions: 415 Maximum Qty/Pack: 15 kg
Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity
Packing Instructions: Y415 Maximum Qty/Pack: 1 kg
Shipping Name: FLAMMABLE SOLID, TOXIC, ORGANIC, N.O.S.
*(CONTAINS 1H-BENZOTRIAZOLE)

Maritime Transport IMDG:

IMDG Class: 4.1 IMDG Subrisk: 6.1
UN Number: 2926 Packing Group: II
EMS Number: F-A , S-G Special provisions: 274 915
Limited Quantities: 1 kg
Shipping Name: FLAMMABLE SOLID, TOXIC, ORGANIC, N.O.S.

Section 15 - REGULATORY INFORMATION

1H-benzotriazole (CAS: 95-14-7,25377-81-5,27556-51-0,28880-01-5,70644-74-5,94160-69-7,115773-98-3,116421-31-9,197463-08-4) is found on the following regulatory lists;

"Canada Domestic Substances List (DSL)","OECD Representative List of High Production Volume (HPV) Chemicals","US DOE Temporary Emergency Exposure Limits (TEELs)","US EPA High Production Volume Program Chemical List","US NFPA 499 Combustible Dusts","US Toxic Substances Control Act (TSCA) - Inventory","US TSCA Section 8 (d) - Health and Safety Data Reporting"

Section 16 - OTHER INFORMATION

ND

Substance CAS Suggested codes 1H- benzotriazole 95- 14- 7 1H- benzotriazole 25377- 81- 5 1H- benzotriazole 27556- 51- 0 1H- benzotriazole 28880- 01- 5 1H- benzotriazole 70644- 74- 5 1H- benzotriazole 94160- 69- 7 1H- benzotriazole 115773- 98- 3 1H- benzotriazole 116421- 31- 9 1H- benzotriazole 197463- 08- 4

Ingredients with multiple CAS Nos

Ingredient Name CAS 1H-benzotriazole 95-14-7, 25377-81-5, 27556-51-0, 28880-01-5, 70644-74-5, 94160-69-7, 115773-98-3, 116421-31-9, 197463-08-4

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes 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.

Issue Date: Mar-14-2009

Print Date:Dec-29-2010