

# Benfuracarb

sc-278723



The Power to Question

## Material Safety Data Sheet

Hazard Alert Code  
Key:

EXTREME

HIGH

MODERATE

LOW

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

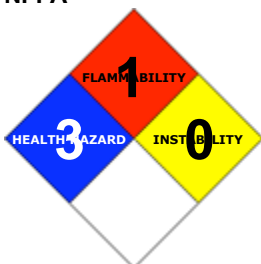
### PRODUCT NAME

Benfuracarb

### 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

C20-H30-N2-O5-S, "beta-alanine, N-((((2, 3-dihydro-2, 2-dimethyl-7-, benzofuranyl)oxy)carbonyl)-, "methylamino)thio]-N-(1-methylethyl)-, ethyl ester", "ethyl-N-[2, 3-dihydro-2, 2-dimethylbenzofuran-7-yloxy)carbonyl(methyl)-, aminothio]-N-isopropyl-beta-alaninate, "2, 3-dihydro-2, 2-dimethyl-7-benzofuranyl-2-methyl-4-(1-methylethyl)-", 7-, "oxo-8-oxa-3-thia-2, 4-diazadecanoate", "ethyl N-((((2, 3-dihydro-2, 2-dimethyl-7-benzofuranyl)oxy)carbonyl)-, methylamino)thio]-N-(1-methylethyl)-beta-alaninate, OK-174, Oncol, "carbamate pesticide/ insecticide"

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability	1	
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

Toxic by inhalation and if swallowed.

Toxic to bees.

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 may produce nausea, vomiting, depressed appetite, abdominal cramps, and diarrhoea.

■ Symptoms may include nausea, headache, giddiness, blurred vision, contraction of pupils, vomiting.

#### EYE

■ There is some evidence to suggest that this material can cause eye irritation and damage in some persons.

■ Direct eye contact can produce tears, eyelid twitches, pupil contraction, loss of focus, and blurred or dimmed vision.

Dilation of the pupils occasionally occurs.

#### SKIN

■ The liquid may be miscible with fats or oils and may degrease the skin, producing a skin reaction described as non-allergic contact dermatitis.

The material is unlikely to produce an irritant dermatitis as described in EC Directives .

■ Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.

■ There may be sweating and muscle twitches at site of contact.

Reaction may be delayed by hours.

■ 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 aerosols (mists, fumes), generated by the material during the course of normal handling, may produce toxic effects; these may be fatal.

■ The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models).

Nevertheless inhalation of vapors, fumes or aerosols, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.

■ Poisoning due to cholinesterase inhibitors causes symptoms such as increased blood flow to the nose, watery discharge, chest discomfort, shortness of breath and wheezing.

Other symptoms include increased production of tears, nausea and vomiting, diarrhoea, stomach pain, involuntary passing of urine and stools, chest pain, breathing difficulty, low blood pressure, irregular heartbeat, loss of reflexes, twitching, visual disturbances, altered pupil size, convulsions, lung congestion, coma and heart failure.

■ Symptoms of carbamate poisoning are similar to that of organophosphate poisoning, however, recovery from carbamate poisoning is quicker and generally less likely to be cause death.

### CHRONIC HEALTH EFFECTS

■ Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

Repeated or prolonged exposures to cholinesterase inhibitors produce symptoms similar to acute effects. In addition workers exposed repeatedly to these substances may exhibit impaired memory and loss of concentration, severe depression and acute psychosis, irritability, confusion, apathy, emotional liability, speech difficulties, headache, spatial disorientation, delayed reaction times, sleepwalking, drowsiness or insomnia. An influenza-like condition with nausea, weakness, anorexia and malaise has been described. There is a growing body of evidence from epidemiological studies and from experimental laboratory studies that short-term exposure to some cholinesterase-inhibiting insecticides may produce behavioural or neuro-chemical changes lasting for days or months, presumably outlasting the cholinesterase inhibition. Although the number of adverse effects following humans poisonings subside, there are still effects in some workers months after cholinesterase activity returns to normal. These long-lasting effects include blurred vision, headache, weakness, and anorexia. The neurochemistry of animals exposed to chlorpyrifos or fenthion is reported to be altered permanently after a single exposure. These effects may be more severe in developing animals where both acetyl- and butyrylcholinesterase may play an integral part in the development of the nervous system. Padilla S., The Neurotoxicity of Cholinesterase-Inhibiting Insecticides Past and Present Evidence Demonstrating Persistent Effects. Inhalation Toxicology 7903-907, 1995.

BE AWARE Repeated minor exposures with only mild symptoms may have serious cumulative poisoning effect.

### Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
benfuracarb	82560-54-1	>98

### Section 4 - FIRST AID MEASURES

#### SWALLOWED

If swallowed

- Contact a Poisons Information Centre or a doctor at once.
- If swallowed, activated charcoal may be advised.
- Give atropine if instructed.
- REFER FOR MEDICAL ATTENTION WITHOUT DELAY.

#### 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.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.

#### SKIN

If product comes in contact with skin

- Contact a Poisons Information Centre or a doctor.
- DO NOT allow clothing wet with product to remain in contact with skin, strip all contaminated clothing including boots.
- Quickly wash affected areas vigorously with soap and water.
- DO NOT give anything by mouth to a patient showing signs of narcosis, i.e. losing consciousness.

#### INHALED

- If spray mist, vapor are inhaled, remove from contaminated area.
- Contact a Poisons Information Centre or a doctor at once.
- Lay patient down in a clean area and strip any clothing wet with spray.
- Prosthesis such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.

#### NOTES TO PHYSICIAN

■ Following acute or short term repeated exposures to carbamates

- Carbamylation of acetylcholinesterase produces symptoms of muscarinic and nicotinic poisoning. Clinical effects disappear within 24 hours following spontaneous, in vivo, hydrolysis of the complex. Symptoms develop within 15 minutes to 2 hours.
- Access the adequacy of the airway and ventilation and use oxygen, suction, intubation, artificial ventilation, intravenous lines and cardiac monitors as needed.
- Usual methods of decontamination (Ipecac / lavage / charcoal / cathartics) may be used when the patient presents within 2-4 hours after exposure. When Ipecac Syrup is used the patient must be observed closely to prevent aspiration.
- Atropine is the antidote of choice. Pralidoxime [and other oximes] usually is unnecessary and, in any case, may reduce the effectiveness of atropine. [Mild cases should be given 1 to 2 mg intramuscularly every 10 minutes until full atropinization has been achieved and repeated thereafter whenever symptoms reappear. Severe cases should given 2 to 4 mg intramuscularly every 10 minutes until fully atropinized, then every 30 to 60 minutes to maintain the effect for at least 12 hours - Incitec] [Ellenhorn and Barceloux Medical Toxicology]

Benfuracarb is metabolised rapidly and almost completely in rats and excreted in 7 days within both the urine and faeces. Major faecal metabolites include carbofuran, carbofuran phenol, 3-hydroxycarbofuran, 3-hydroxyphenol, and 3-ketophenol. Urinary metabolites are the beta-glucuronide conjugates of these.

### Section 5 - FIRE FIGHTING MEASURES

Vapor Pressure (mmHg)	199.516 uPa (20 C)
Upper Explosive Limit (%)	Not available
Specific Gravity (water=1)	1.171
Lower Explosive Limit (%)	Not available

#### 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 full body protective clothing with breathing apparatus.
  - Prevent, by any means available, spillage from entering drains or water course.
  - Consider evacuation (or protect in place).
  - If containment of runoff is not possible, consider allowing fire to burn-out. Use of water may present a significant pollution hazard.
- 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.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).

Combustion products include carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), other pyrolysis products typical of burning organic material.

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

## Section 6 - ACCIDENTAL RELEASE MEASURES

#### **MINOR SPILLS**

Environmental hazard - contain spillage.

Slippery when spilt.

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.

#### **MAJOR SPILLS**

Environmental hazard - contain spillage.

Slippery when spilt.

- DO NOT touch the spill material
- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.

## 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.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.

#### **RECOMMENDED STORAGE METHODS**

- Lined metal can, lined metal pail/ can.
- Plastic pail.
- Polyliner drum.
- Packing as recommended by manufacturer.
- DO NOT use unlined steel containers

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.

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#### **STORAGE REQUIREMENTS**

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

The following materials had no OELs on our records

- benfuracarb CAS82560-54-1

### PERSONAL PROTECTION



### RESPIRATOR

- Type A-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.
- 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], [AS/NZS 1336 or national equivalent]

### HANDS/FEET

- Wear chemical protective gloves, eg. PVC.
- Wear safety footwear or safety gumboots, eg. Rubber

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

### OTHER

- Overalls.
- Eyewash unit.
- Barrier cream.
- Skin cleansing cream.
- Ensure that there is a supply of atropine tablets on hand
- Ensure all employees have been informed of symptoms of cholinesterase poisoning and that the use of atropine in first aid is understood .

### 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

Liquid.

Does not mix with water.

Sinks in water.

Toxic or noxious vapors/gas.

State	Liquid	Molecular Weight	410.53
Melting Range (°F)	Not available	Viscosity	Not Available

Boiling Range (°F)	230 (0.023 mm)	Solubility in water (g/L)	Partly miscible
Flash Point (°F)	237(CC)	pH (1% solution)	Not applicable.
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available.	Vapor Pressure (mmHg)	199.516 uPa (20 C)
Upper Explosive Limit (%)	Not available	Specific Gravity (water=1)	1.171
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	>1
Volatile Component (%vol)	Not available.	Evaporation Rate	Not available

## APPEARANCE

Viscous liquid; does not mix well with water (8 mg/l, 20 C). Solubilities Greater than 50% benzene, dichloromethane, methanol, acetone, hexane, xylene, ethyl acetate. Stable in neutral and weakly basic media; unstable in acid or strongly basic media. Degraded on glass plate by sunlight; DT50 3 hours.

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

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

### STORAGE INCOMPATIBILITY

- Carbamates are incompatible with strong acids and bases, and especially incompatible with strong reducing agents such as hydrides.
- Flammable gaseous hydrogen is produced by the combination of active metals or nitrides with carbamates.
- Strongly oxidizing acids, peroxides, and hydroperoxides are incompatible with carbamates.

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

## Section 11 - TOXICOLOGICAL INFORMATION

benfuracarb

### TOXICITY AND IRRITATION

■ [\* The Pesticides Manual, Incorporating The Agrochemicals Handbook, 10th Edition, Editor Clive Tomlin, 1994, British Crop Protection Council].

### CARCINOGEN

Non-arsenical insecticides (occupational exposures in spraying and application of) International Agency for Research on Cancer (IARC) Group 2A  
- Agents Reviewed by the IARC Monographs

## Section 12 - ECOLOGICAL INFORMATION

Toxic to bees.

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.

### Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
benfuracarb	No Data Available	No Data Available		

## Section 13 - DISPOSAL CONSIDERATIONS

### Disposal Instructions

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

- Containers may still present a chemical hazard/ danger when empty.
- Return to supplier for reuse/ recycling if possible.

Otherwise:

- If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorized landfill.
- Where possible retain label warnings and MSDS and observe all notices pertaining to the product.

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 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.
- Consult manufacturer for recycling options.
- Consult Land Waste Management Authority for disposal options.
- For disposal of residue:
- Add with stirring to strongly alkaline solution of calcium hypochlorite. Let stand for 24 hours and then route cyanate to sewage treatment plant.

OR

- Mix with flammable solvent and spray into incinerator equipped with afterburner and scrubber.
- Decontaminate empty containers.
- Return containers to drum reconditioner or recycler.

OR

- Puncture containers to prevent reuse and bury at an authorized landfill.

## Section 14 - TRANSPORTATION INFORMATION



### DOT:

Symbols:	None	Hazard class or Division:	6.1
Identification Numbers:	UN2992	PG:	III
Label Codes:	6.1	Special provisions:	IB3, T7, TP2, TP28
Packaging: Exceptions:	153	Packaging: Non-bulk:	203
Packaging: Exceptions:	153	Quantity limitations: Passenger aircraft/rail:	60 L
Quantity Limitations: Cargo aircraft only:	220 L	Vessel stowage: Location:	A
Vessel stowage: Other:	40		
Hazardous materials descriptions and proper shipping names: Carbamate pesticides, liquid, toxic			
<b>Air Transport IATA:</b>			
ICAO/IATA Class:	6.1	ICAO/IATA Subrisk:	None
UN/ID Number:	2992	Packing Group:	III
Special provisions:	A3		

Cargo Only

Packing Instructions:	663	Maximum Qty/Pack:	220 L
Passenger and Cargo		Passenger and Cargo	
Packing Instructions:	655	Maximum Qty/Pack:	60 L
Passenger and Cargo		Passenger and Cargo	
Limited Quantity		Limited Quantity	
Packing Instructions:	Y642	Maximum Qty/Pack:	2 L

Shipping name: CARBAMATE PESTICIDE, LIQUID, TOXIC (contains benfuracarb)

**Maritime Transport IMDG:**

IMDG Class:	6.1	IMDG Subrisk:	None
UN Number:	2992	Packing Group:	III
EMS Number:	F-A, S-A	Special provisions:	61 223 274
Limited Quantities:	5 L	Marine Pollutant:	Yes

Shipping name: CARBAMATE PESTICIDE, LIQUID, TOXIC (contains benfuracarb)

**Section 15 - REGULATORY INFORMATION**

**benfuracarb (CAS: 82560-54-1) is found on the following regulatory lists;**

"International Maritime Dangerous Goods Requirements (IMDG Code) - Substance Index"

**Section 16 - OTHER INFORMATION**

**LIMITED EVIDENCE**

- Skin contact may produce health damage\*.
- Cumulative effects may result following exposure\*.
- May produce discomfort of the eyes\*.

\* (limited evidence).

■ 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.

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