

# Furazolidone

sc-218546



The Power is Question

Material Safety Data Sheet

Hazard Alert Code Key: **EXTREME** **HIGH** **MODERATE** **LOW**

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

Furazolidone

### 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

C8-H7-N3-O5, furozolidone, 3-(((5-nitro-2-furanyl)methylene)amino)-2-oxazolidinone, nitrofurazolidone, "3-(5' -nitrofurfuralamino)-2-oxazolidone", N-(5-nitro-2-furfurylidene)-3-aminooxazolidine-2-one, 3-((5-nitrofurfurylideneamino)-2-oxazolidine, N-(5-nitro-2-furfurylidene)-3-amino-2-oxazolidone, 3-((nitrofurylidene)amino)-2-oxazolidone, 5-nitro-N-(2-oxo-3-oxazolidinyl)-2-furanmethanimine, "2-oxazolidinone, 3-(((5-nitro-2-furanyl)methylene)amino)-", Bifuron, Corizium, Diafuron, Enterotoxon, Furaxon, Furaxone, Furazol, Furazon, Furidon, Furovag, Furox, Furoxal, Furoxane, Furoxon, Furoxone, "Furoxone Swine Mix", Giardil, Giarlam, Medaron, Neftin, NF-180, Nicolen, Nifulidone, Nifuran, Nitrofurazolidonum, Nitrofuroxan, Optazol, Ortazol, Puradin, Roptazol, Sclaventerol, Tikofuran, Tricofuran, Trifurox, "USAF EA-1", Viofuragyn, "anti-bacterial/ antiprotozoal agent"

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

|               | Min | Max |
|---------------|-----|-----|
| Flammability: | 1   |     |
| 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

Limited evidence of a carcinogenic effect.  
Possible risk of impaired fertility.  
Harmful by inhalation, in contact with skin and if swallowed.

### 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.  
■ Monoamine oxidase inhibitors (MAOIs) cause low blood pressure, dizziness, drowsiness, weakness and tiredness, dry mouth, constipation, other digestive disturbances (including nausea and vomiting) and swelling.  
Other symptoms include agitation and tremors, sleep disturbance, blurred vision, difficulty urinating, convulsions, skin rash, loss of white blood cells, sexual disturbances and weight gain.

##### EYE

■ There is some evidence to suggest that this material can cause eye irritation and damage in some persons.  
■ Because of their alkaline nature eye contact with oxazolidines may produce moderate to severe irritation depending on the duration of contact.

##### SKIN

■ Skin contact with the material may be harmful; systemic effects may result following absorption.  
■ There is some evidence to suggest that this material can cause inflammation of the skin on contact in some persons.  
■ 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.  
■ Oxazolidines generally do not produce systemic harmful following skin contact but, because of their alkaline nature, may produce moderate to severe irritation.  
Dermal reactions may include necrosis, sloughing and scab formation.

##### INHALED

■ Inhalation of dusts, generated by the material, during the course of normal handling, may be harmful.  
■ The material is not thought to produce respiratory irritation (as classified using animal models).  
Nevertheless inhalation of dusts, or fume, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.  
■ 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

■ There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment.  
Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility.  
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.  
Derivatives of 5-nitrofurans can increase the risk of bladder cancer.  
Although oxazolidines are able to cross-link with dermal proteins, there is no indication, at present, that they are dermal sensitizers.  
Oral teratology studies indicate that foetal toxicity occurs at maternally toxic doses but that birth defects are not a feature of exposure.  
Oxazolidines are generally not mutagenic in a battery of tests designed to investigate this effect.  
Because they occur as secondary and tertiary amines, the concomitant use of nitrates may result in the production of potentially carcinogenic N-nitrosoamines. There is no evidence available to suggest that oxazolidines constitute a class of carcinogenic substance.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| NAME         | CAS RN  | %   |
|--------------|---------|-----|
| furazolidone | 67-45-8 | >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: · 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 acute poisonings caused by monoamine oxidase inhibitors: The stomach should be emptied by aspiration and lavage and supportive therapy should be instituted. Special care should be taken with any drug therapy in view of the many hazards of monoamine oxidase inhibitor interactions.

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.

## Section 5 - FIRE FIGHTING MEASURES

|                             |                |
|-----------------------------|----------------|
| Vapour Pressure (mmHG):     | Negligible     |
| Upper Explosive Limit (%):  | Not available. |
| Specific Gravity (water=1): | Not available  |
| 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 breathing apparatus plus protective gloves.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

· Combustible solid which burns but propagates flame with difficulty.

· 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 may burn rapidly and fiercely if ignited.

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

May emit poisonous fumes.

May emit corrosive fumes.

### FIRE INCOMPATIBILITY

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

### PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

Respirator:

Particulate

## Section 6 - ACCIDENTAL RELEASE MEASURES

### MINOR SPILLS

- Clean up waste regularly and abnormal spills immediately.
- Avoid breathing dust and contact with skin and eyes.
- Wear protective clothing, gloves, safety glasses and dust respirator.
- Use dry clean up procedures and avoid generating dust.
- Vacuum up or sweep up. NOTE: Vacuum cleaner must be fitted with an exhaust micro filter (HEPA type) (consider explosion-proof machines designed to be grounded during storage and use).

- Dampen with water to prevent dusting before sweeping.
- Place in suitable containers for disposal.

**MAJOR SPILLS**

- Moderate hazard.
- CAUTION: Advise personnel in area.
- Alert Emergency Responders and tell them location and nature of hazard.

**Section 7 - HANDLING AND STORAGE**

**PROCEDURE FOR HANDLING**

- Avoid all personal contact, including inhalation.
  - Wear protective clothing when risk of exposure 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.
- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.

**STORAGE REQUIREMENTS**

- Store in original containers.
  - Keep containers securely sealed.
- Darkens under strong light.

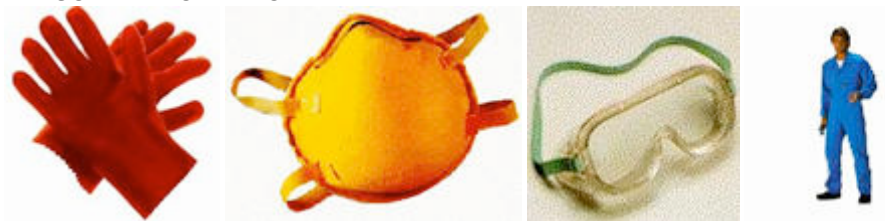
**Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION**

**EXPOSURE CONTROLS**

| Source   | Material  | TWA ppm | TWA mg/m <sup>3</sup> | STEL ppm | STEL mg/m <sup>3</sup> | Peak ppm | Peak mg/m <sup>3</sup> | TWA F/CC | Notes                               |
|--|---|---------|-----------------------|----------|------------------------|----------|------------------------|----------|-------------------------------------|
| US - California Permissible Exposure Limits for Chemical Contaminants            | furazolidone (Particulates not otherwise regulated Respirable fraction)           |         | 5                     |          |                        |          |                        |          | (n)                                 |
| US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants        | furazolidone (Particulates not otherwise regulated Respirable fraction)           |         | 5                     |          |                        |          |                        |          |                                     |
| US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants | furazolidone (Particulates not otherwise regulated (PNOR)(f)-Respirable fraction) |         | 5                     |          |                        |          |                        |          |                                     |
| US - Michigan Exposure Limits for Air Contaminants                               | furazolidone (Particulates not otherwise regulated, Respirable dust)              |         | 5                     |          |                        |          |                        |          |                                     |
| Canada - Prince Edward Island Occupational Exposure Limits                       | furazolidone (Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles)  |         | 10                    |          |                        |          |                        |          | See Appendix B current TLV/BEI Book |

ENDOELTABLE

## PERSONAL PROTECTION



### RESPIRATOR

Particulate

Consult your EHS staff for recommendations

### EYE

■ When handling very small quantities of the material eye protection may not be required.

For laboratory, larger scale or bulk handling or where regular exposure in an occupational setting occurs:

- Chemical goggles
- Face shield. Full face shield may be required for supplementary but never for primary protection of eyes
- 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].

### 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.

- Rubber gloves (nitrile or low-protein, powder-free latex). Employees allergic to latex gloves should use nitrile gloves in preference.
- Double gloving should be considered.
- PVC gloves.
- Protective shoe covers.
- Head covering.

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
- fluorocautchouc
- polyvinyl chloride

Gloves should be examined for wear and/ or degradation constantly.

### OTHER

- For quantities up to 500 grams a laboratory coat may be suitable.
- For quantities up to 1 kilogram a disposable laboratory coat or coverall of low permeability is recommended. Coveralls should be buttoned at collar and cuffs.
- For quantities over 1 kilogram and manufacturing operations, wear disposable coverall of low permeability and disposable shoe covers.
- For manufacturing operations, air-supplied full body suits may be required for the provision of advanced respiratory protection.
- Eye wash unit.
- Ensure there is ready access to an emergency shower.
- For Emergencies: Vinyl suit.

### ENGINEERING CONTROLS

■ Enclosed local exhaust ventilation is required at points of dust, fume or vapor generation.

HEPA terminated local exhaust ventilation should be considered at point of generation of dust, fumes or vapors.

## PHYSICAL PROPERTIES

Solid.

Does not mix with water.

|                           |                    |                                |                  |
|---------------------------|--------------------|--------------------------------|------------------|
| State                     | Divided solid      | Molecular Weight               | 225.2            |
| Melting Range (°F)        | 498.2 (decomposes) | Viscosity                      | Not Applicable   |
| Boiling Range (°F)        | Not available      | Solubility in water (g/L)      | Immiscible       |
| Flash Point (°F)          | Not available      | pH (1% solution)               | 4.5-7 suspension |
| Decomposition Temp (°F)   | 498.2              | pH (as supplied)               | Not applicable   |
| Autoignition Temp (°F)    | Not available      | Vapour Pressure (mmHG)         | Negligible       |
| Upper Explosive Limit (%) | Not available.     | Specific Gravity (water=1)     | Not available    |
| Lower Explosive Limit (%) | Not available      | Relative Vapor Density (air=1) | Not Applicable   |
| Volatile Component (%vol) | Negligible         | Evaporation Rate               | Not applicable   |

## APPEARANCE

Yellow, odourless crystalline powder with slight bitter after-taste; does not mix with water.

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

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

### STORAGE INCOMPATIBILITY

#### ■ Oxazolidines:

- are saturated heterocyclic compounds which behave, chemically, both as aldehydes and amines.
- may hydrolyse in water to yield free amine and hydroxyl groups that react with isocyanate to form urea and urethane linkages
- react readily with most phenolic compounds although phenol itself is the least reactive species requiring elevated temperatures for useful reaction rates
- reaction rates may be diminished by strong bases, lower alcohols and glycols and alkylhydroxylamines
- are effective crosslinkers for proteins with reaction occurring under acidic or alkaline conditions -reaction is thought to involve an opening of the heterocyclic ring followed by reaction with amino groups on the protein
- emulsify oils and waxes due to their alkaline nature and their esters may decompose in the presence of acids
- contact with copper, brass and aluminium should be avoided.
- Avoid strong bases.

Avoid reaction with oxidizing agents.

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

## Section 11 - TOXICOLOGICAL INFORMATION

furazolidone

### TOXICITY AND IRRITATION

FURAZOLIDONE:

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

| TOXICITY                                | IRRITATION   |
|---|--------------|
| Oral (rat) LD50: 2336 mg/kg             | Nil Reported |
| Oral (mouse) LD50: 1782 mg/kg           |              |
| Intraperitoneal (mouse) LD50: 300 mg/kg |              |
| Oral (Human) TDLo: 11 mg/kg             |              |
| Oral (Mouse) LD50: 1.807 mg/kg          |              |

#### ■ The substance is classified by IARC as Group 3:

NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

Dyspnae, respiratory depression, eosinophilia, paternal effects

(involving spermatogenesis) and abortion recorded.

ADI: 0.0004 mg/kg/day

NOEL: 0.75 mg/kg/day

### CARCINOGEN

|              |                          |              |     |
|--------------|--------------------------|--------------|-----|
| FURAZOLIDONE | US Environmental Defense | Reference(s) | P65 |
|--------------|--------------------------|--------------|-----|

| Scorecard Recognized Carcinogens |  |              |     |
|----------------------------------|--|--------------|-----|
| FURAZOLIDONE                     | US Environmental Defense Scorecard Suspected Carcinogens | Reference(s) | P65 |

## Section 12 - ECOLOGICAL INFORMATION

No data

### Ecotoxicity

| Ingredient   | Persistence:<br>Water/Soil | Persistence: Air | Bioaccumulation | Mobility |
|--------------|----------------------------|------------------|-----------------|----------|
| furazolidone | HIGH                       |                  | LOW             | MED      |

## 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. 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

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: DOT, IATA, IMDG

## Section 15 - REGULATORY INFORMATION

### furazolidone (CAS: 67-45-8) is found on the following regulatory lists;

"Canada Domestic Substances List (DSL)", "International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs", "US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances which need not be reported unless manufactured by the facility", "US - California Proposition 65 - Carcinogens", "US - California Proposition 65 - Priority List for the Development of NSRLs for Carcinogens", "US - Maine Chemicals of High Concern List", "US - Washington Class A toxic air pollutants: Known and Probable Carcinogens", "US Toxic Substances Control Act (TSCA) - Inventory"

## Section 16 - OTHER INFORMATION

### ND

Substance CAS Suggested codes furazolidone 67- 45- 8

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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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