

# Metam-sodium hydrate

sc-235603



The Power is Question

Material Safety Data Sheet

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

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

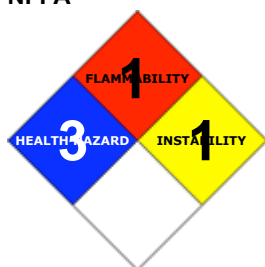
### PRODUCT NAME

Metam-sodium hydrate

### 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

C2-H4-N-S2.Na.2H2O, "carbamic acid, methylthio-, sodium salt, dihydrate", "N-methylthiocarbamic acid, sodium salt, dihydrate", "methylthiocarbamic acid, sodium salt, dihydrate", "sodium methylthiocarbamate dihydrate", "sodium N-methylthiocarbamate dihydrate", "soil fumigant", Herbatim, Karbation, Maposol, Metam, SMDC, Trimaton, Vapam, Vaporooter, VPM

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

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

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



### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Contact with acids liberates toxic gas.

Causes burns.

Risk of serious damage to eyes.

May cause SENSITISATION by skin contact.

Harmful in contact with skin and if swallowed.

Very toxic 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.

■ The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.

#### EYE

■ The material can produce chemical burns to the eye following direct contact. Vapors or mists may be extremely irritating.

■ If applied to the eyes, this material causes severe eye damage.

■ Exposure to H<sub>2</sub>S may produce pain, blurred vision, and irritation. These symptoms are temporary in all but severe cases. Eye irritation may produce conjunctivitis, photophobia, pain, and at higher concentrations blurred vision and corneal blistering.

#### SKIN

■ The material can produce chemical burns following direct contact with the skin.

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

■ Open cuts, abraded or irritated skin should not be exposed to this material.

■ Solution of material in moisture on the skin, or perspiration, may increase irritant effects.

■ 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

■ If inhaled, this material can irritate the throat and lungs of some persons.

■ 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.

■ Hydrogen sulfide poisoning can cause increased secretion of saliva, nausea, vomiting, diarrhea, giddiness, headache, vertigo, memory loss, palpitations, heartbeat irregularities, weakness, muscle cramps, confusion, sudden collapse, unconsciousness and death due to paralysis of breathing (at levels above 300 parts per million). The "rotten egg" odor is not a good indicator of exposure since odor fatigue occurs and odor is lost at over 200 ppm.

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■ Inhalation of methyl isothiocyanate (MITC) may irritate nose, throat and lungs causing coughing, wheezing and /or shortness of breath. Symptoms of exposure include headache, dizziness, depression, irritability, seizures, nausea, vomiting and loss of consciousness MITC This has been implicated in dystrophic changes (disorders arising from nutritional defects) and disintegration of liver cells.

### CHRONIC HEALTH EFFECTS

■ Repeated or long-term occupational exposure is likely to produce cumulative health effects involving organs or biochemical systems.

Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue.

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Skin contact with the material is more likely to cause a sensitization reaction in some persons compared to the general population.

Exposure to the material may cause concerns for human fertility, on the basis that similar materials provide some evidence of impaired fertility in the absence of toxic effects, or evidence of impaired fertility occurring at around the same dose levels as other toxic effects, but which are not a secondary non-specific consequence of other toxic effects.

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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.

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Long term low level exposure to hydrogen sulfide may produce headache, fatigue, dizziness, irritability and loss of sexual desire. These symptoms may also result when exposed to hydrogen sulfide at high concentration for a short period of time.

Some dithiocarbamates may cause birth defects and cancer and may affect male reproductive capacity. They may also cause goiter (overactivity of the thyroid gland) and nerve disorders.

Thiocarbamates have been shown to alter sperm form and therefore reproduction.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
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metham dihydrate	6734-80-1	100
(sodium N-methyldithiocarbamate dihydrate)		
NOTE: Decomposes slowly on contact with water to		
produce		
<a href="#">hydrogen sulfide</a>	7783-06-4	
<a href="#">methyl isothiocyanate</a>	556-61-6	

## Section 4 - FIRST AID MEASURES

### SWALLOWED

· For advice, contact a Poisons Information Center or a doctor at once. · Urgent hospital treatment is likely to be needed.

### 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 or hair contact occurs: · Immediately flush body and clothes with large amounts of water, using safety shower if available. · Quickly remove all contaminated clothing, including footwear.

### INHALED

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

### NOTES TO PHYSICIAN

■ Medical literature on human exposure to thiocarbamate derivatives is scarce.  
 · Animal studies suggest that contact dermatitis and thyroid hyperplasia may occur following exposure.  
 · These compounds do not have the cholinergic properties of structurally related carbamate insecticides.

As a general rule thiocarbamates can be absorbed by the skin, mucous membranes and respiratory and gastrointestinal tract. They are eliminated quickly via expired air and urine.

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## Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Not applicable
Upper Explosive Limit (%):	Not applicable
Specific Gravity (water=1):	1.143
Lower Explosive Limit (%):	Not applicable

### EXTINGUISHING MEDIA

· Water spray or fog.  
 · 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

· 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>), sulfur oxides (SO<sub>x</sub>), 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.

### PERSONAL PROTECTION

Glasses:

Full face- shield.

Gloves:

Respirator:

Type A-P Filter of sufficient capacity

## 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

- 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 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.

- 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.

### 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 <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	TWA F/CC	Notes
US - Minnesota Permissible Exposure Limits (PELs)	hydrogen sulfide (Hydrogen sulfide)	10	14	15	21				
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	hydrogen sulfide (HYDROGEN SULFIDE)	0.07							
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	hydrogen sulfide (HYDROGEN SULFIDE)	0.02							
Canada - British Columbia Occupational Exposure Limits	hydrogen sulfide (Hydrogen sulfide)					10			
US ACGIH Threshold Limit Values (TLV)	hydrogen sulfide (Hydrogen sulfide)	1		5					TLV Basis: upper respiratory tract irritation; central nervous system impairment

US NIOSH Recommended Exposure Limits (RELs)	hydrogen sulfide (Hydrogen sulfide)			10		15		(Ceiling ([10-minute]))
Canada - Alberta Occupational Exposure Limits	hydrogen sulfide (Hydrogen sulphide)	10	14			15	21	
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	hydrogen sulfide (Hydrogen sulfide)	10	14	15	21			
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	hydrogen sulfide (Hydrogen sulfide)			See Table Z-2				
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	hydrogen sulfide (Hydrogen sulfide)	10	14	15	21	20		
US - Idaho - Acceptable Maximum Peak Concentrations	hydrogen sulfide (Hydrogen sulfide (Z37.2-1966))					20		
US - California Permissible Exposure Limits for Chemical Contaminants	hydrogen sulfide (Hydrogen sulfide)	10	14	15	21	50		
US - Idaho - Limits for Air Contaminants	hydrogen sulfide (Hydrogen sulfid)		[2]					
US OSHA Permissible Exposure Levels (PELs) - Table Z2	hydrogen sulfide (Hydrogen sulfide (Z37.2-1966))					20		
US - Alaska Limits for Air Contaminants	hydrogen sulfide (Hydrogen sulfide)	10	14	15	21			
US - Michigan Exposure Limits for Air Contaminants	hydrogen sulfide (Hydrogen sulphide)	10	14	15	21			
US - Hawaii Air Contaminant Limits	hydrogen sulfide (Hydrogen sulfide)	10	14	15	21			
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	hydrogen sulfide (Hydrogen sulphide)	10	15	15	27			
US - Washington Permissible exposure limits of air contaminants	hydrogen sulfide (Hydrogen sulfide)	10		15				
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination	hydrogen sulfide (Hydrogen sulphide)	10		15				

## Limits

Canada - Northwest Territories Occupational Exposure Limits (English)	hydrogen sulfide (Hydrogen sulfide)	10	14	15	21	20	28
US - Wyoming Toxic and Hazardous Substances Table Z-2 Acceptable ceiling concentration, Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift	hydrogen sulfide (Hydrogen sulfide (Z37.2-1966))					20	
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	hydrogen sulfide (Hydrogen sulfide)	10	14	15	21		
US - Oregon Permissible Exposure Limits (Z-2)	hydrogen sulfide (Hydrogen sulfide (Z37.2-1966))					20	
Canada - Nova Scotia Occupational Exposure Limits	hydrogen sulfide (Hydrogen sulfide)	10		15			
Canada - Prince Edward Island Occupational Exposure Limits	hydrogen sulfide (Hydrogen sulfide)	1		5			

TLV Basis:  
upper  
respiratory tract  
irritation; central  
nervous system  
impairment

## ENDOELTABLE

The following materials had no OELs on our records

- metham dihydrate: CAS:6734-80-1
- methyl isothiocyanate: CAS:556-61-6

## PERSONAL PROTECTION



### RESPIRATOR

Type A-P Filter of sufficient capacity

Consult your EHS staff for recommendations

### EYE

- Chemical goggles.
- Full face shield.

### HANDS/FEET

- Wear chemical protective gloves, eg. PVC.

NOTE: The material may produce skin sensitization in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

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.

#### OTHER

- Overalls.
- Eyewash unit.

#### ENGINEERING CONTROLS

- 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

Solid.

Mixes with water.

Contact with acids liberates toxic gas.

State	Divided solid	Molecular Weight	165.22
Melting Range (°F)	Not available.	Viscosity	Not Applicable
Boiling Range (°F)	Not available.	Solubility in water (g/L)	Miscible
Flash Point (°F)	>199.4	pH (1% solution)	9-10.5
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not applicable	Vapour Pressure (mmHG)	Not applicable
Upper Explosive Limit (%)	Not applicable	Specific Gravity (water=1)	1.143
Lower Explosive Limit (%)	Not applicable	Relative Vapor Density (air=1)	Not applicable
Volatile Component (%vol)	Not applicable	Evaporation Rate	Not applicable

### APPEARANCE

White crystalline solid with unpleasant odour similar to that of carbon disulphide. Soluble in water (72.2g/100ml @ 20 C), moderately soluble in alcohol, sparingly soluble in other solvents. Unstable as a solid. Also available as dihydrate. Decomposes slowly in dilute aqueous solution.

log Kow 1.374

Material	Value

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

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

### STORAGE INCOMPATIBILITY

- Contact with acids produces toxic fumes.
  - Thiocarbamates and dithiocarbamates are incompatible with acids, peroxides, and acid halides.
  - Flammable gases are generated by the combination of thiocarbamates and dithiocarbamates with aldehydes, nitrides, and hydrides.
- Avoid reaction with oxidizing agents.

Methyl isothiocyanate:

- is incompatible with strong acids, strong bases, caustics, chlorates (e.g. potassium chlorate, sodium chlorate), ammonia, amines, amides, alcohols, glycols, caprolactam solution, nitric acid, nitrates, organic peroxides, peroxides, strong oxidisers
- is corrosive to zinc, copper, aluminium, and their alloys, iron and other metals - rapidly forms black precipitate on contact with ordinary steel.

Hydrogen sulfide (H2S):

- is a highly flammable and reactive gas
- reacts violently with strong oxidisers, metal oxides, metal dusts and powders, bromine pentafluoride, chlorine trifluoride, chromium trioxide, chromyl chloride, dichlorine oxide, nitrogen trichloride, nitryl hypofluorite, oxygen difluoride, perchloryl fluoride, phospham, phosphorus persulfide, silver fulminate, soda-lime, sodium peroxide
- is incompatible with acetaldehyde, chlorine monoxide, chromic acid, chromic anhydride, copper, nitric acid, phenyldiazonium chloride, sodium
- forms explosive material with benzenediazonium salts
- attacks many metals

Flow or agitation of hydrogen sulfide may generate electrostatic charges due to low conductivity.

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

## Section 11 - TOXICOLOGICAL INFORMATION

METHAM DIHYDRATE

### TOXICITY AND IRRITATION

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

METHYL ISOTHIOCYANATE:

METHAM DIHYDRATE:

■ 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.

■ Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's edema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type.

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METHAM DIHYDRATE:

TOXICITY	IRRITATION
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Oral (rat) LD50: 108 mg/kg	Nil Reported
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Dermal (rat) LD50: 638 mg/kg	
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Dermal (rabbit) LD50: 800 mg/kg

for metam-sodium

Reproductive effector in rats.

### TOXICITY

### IRRITATION

### HYDROGEN SULFIDE:

Inhalation (human) LDLo: 5.7 mg/kg

Nil  
Reported

Inhalation (human) LCLo: 600 ppm/30m

Inhalation (human) LCLo: 800 ppm/5m

METHYL ISOTHIOCYANATE:

Oral (woman) LDLo: 1000 mg/kg

Skin  
(rabbit):  
500  
mg/24h -  
Moderate

Oral (rat) LD50: 72 mg/kg

Eye (rabbit): 100 mg - SEVERE

Inhalation (rat) LC50: 1900 mg/m<sup>3</sup>/1h

Dermal (rat) LD50: 2780 mg/kg

Oral (mouse) LD50: 90 mg/kg

Dermal (mouse) LD50: 1820 mg/kg

■ The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.



A single dose oral toxicity test of methyl isothiocyanate was conducted in female rats according to the OECD Test Guideline 423. Deaths resulted in all animals at 300 mg/kg, but in none at 50 mg/kg. In the 300 mg/kg group, pale skin, salivation, restlessness, clonic convulsions, reddish lungs and dark red focal areas in the lungs were noted. From the results, methyl isothiocyanate was classified in category 3 of the GHS regarding acute toxicity and the LD50 cut-off value was estimated to be 200 mg/kg.

A combined repeated dose and reproductive/developmental toxicity screening test of methyl isothiocyanate was also conducted in rats according to the OECD Test Guideline 422. Oral administration of the compound at doses of 0, 0.5, 2 and 8 mg/kg did not cause death. Salivation was observed in both sexes at 8 mg/kg and in 1 male at 2 mg/kg group. Suppression of body weight gain and food consumption was further observed in males of the 8 mg/kg group along with increases in the red blood cell count and hemoglobin concentration. Thickening/edema of the mucosa and diffuse squamous cell hyperplasia of the forestomach were observed in both sexes at 2 mg/kg and above. Adverse effects on body weight and hematological parameters proved reversible; however, pathological changes in the forestomach persisted 14 days after withdrawal. In the 8 mg/kg group, abnormal parturition/lactation was observed, resulting in decrease in the number of pups and the viability index. The NOEL for repeated dose toxicity of methyl isothiocyanate is considered to be 0.5 mg/kg/day in both sexes and the NOEL for reproductive toxicity is considered to be 2 mg/kg in females and 8 mg/kg in males and offspring.

A reverse mutation test using bacteria was performed to examine the mutagenic potential of methyl isothiocyanate. The compound did not induce gene mutations in bacteria under the conditions of this study.

An in vitro chromosomal aberration test of methyl isothiocyanate was performed using a fibroblast cell line (CHL/IU) derived from the lung of a Chinese hamster. Methyl isothiocyanate induced chromosomal aberrations under the conditions of this study.

Convulsions, change in motor activity, coma recorded.

### CARCINOGEN

METHAM SODIUM	US Environmental Defense Scorecard Recognized Carcinogens	Reference(s)	P65
METHAM SODIUM	US Environmental Defense Scorecard Suspected Carcinogens	Reference(s)	P65

## 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.

### Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
metham dihydrate	HIGH		LOW	HIGH
hydrogen sulfide	LOW		LOW	HIGH
methyl isothiocyanate	HIGH		LOW	HIGH

### 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 \_\_\_\_\_  
 \_\_\_\_\_ Metam- 202 434 0 NI 0 NR 4 NI 1 2 (2) 2 1 S D 2 sodium (ISO) / CAS:6734-80-1 / FC2100000

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=Acute mammalian 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

Reactivity characteristic: use EPA hazardous waste number D003 (waste code R).

B. Component Waste Numbers

When hydrogen sulfide is present as a solid waste as a discarded commercial

chemical product, off-specification species, as a container residue, or a spill residue, use EPA waste number U135 (waste code T).

### 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: None Hazard class or Division: 6.1

Identification Numbers: UN2588 PG: III

Label Codes: 6.1 Special provisions: IB8, IP3, T1, TP33

Packaging: Exceptions: 153 Packaging: Non- bulk: 213

Packaging: Exceptions: 153 Quantity limitations: 100 kg

Passenger aircraft/rail:

Quantity Limitations: Cargo 200 kg Vessel stowage: Location: A aircraft only:

Vessel stowage: Other: 40 S.M.P.: YES

Hazardous materials descriptions and proper shipping names:

Pesticides, solid, toxic, n.o.s.

### Air Transport IATA:

ICAO/IATA Class: 6.1 ICAO/IATA Subrisk: None

UN/ID Number: 2588 Packing Group: III

Special provisions: A3

Cargo Only

Packing Instructions: 619 Maximum Qty/Pack: 200 kg

Passenger and Cargo Passenger and Cargo

Packing Instructions: 619 Maximum Qty/Pack: 100 kg

Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity

Packing Instructions: Y619 Maximum Qty/Pack: 10 kg

Shipping Name: PESTICIDE, SOLID, TOXIC, N.O.S. \*(CONTAINS METHAM DIHYDRATE)

### Maritime Transport IMDG:

IMDG Class: 6.1 IMDG Subrisk: None

UN Number: 2588 Packing Group: III

EMS Number: F-A , S-A Special provisions: 61 223 274

Limited Quantities: 5 kg Marine Pollutant: Yes

Shipping Name: PESTICIDE, SOLID, TOXIC, N.O.S.

## Section 15 - REGULATORY INFORMATION

### metham dihydrate (CAS: 6734-80-1) is found on the following regulatory lists;

"Canada - Saskatchewan Environmental Persistent or Chronic Hazardous Substances", "Canada Domestic Substances List (DSL)", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "OECD Representative List of High Production Volume (HPV) Chemicals", "US - California Proposition 65 - Carcinogens", "US - California Proposition 65 - Priority List for the Development of MADLs for Chemicals Causing Reproductive Toxicity", "US - California Proposition 65 - Priority List for the Development of NSRLs for Carcinogens", "US - California Proposition 65 - Reproductive Toxicity", "US - Maine Chemicals of High Concern List", "US - Massachusetts Oil & Hazardous Material List", "US - Vermont Hazardous Constituents", "US - Washington Dangerous waste constituents list", "US Department of Transportation

(DOT) Marine Pollutants - Appendix B", "US EPA High Production Volume Chemicals 1994 List of Additions", "US EPCRA Section 313 Chemical List", "US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act", "US RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261"

### Regulations for ingredients

#### hydrogen sulfide (CAS: 7783-06-4) is found on the following regulatory lists;

"Canada - Alberta Ambient Air Quality Objectives", "Canada - Alberta Ambient Air Quality Objectives - Other", "Canada - Alberta Occupational Exposure Limits", "Canada - British Columbia Occupational Exposure Limits", "Canada - Northwest Territories Occupational Exposure Limits (English)", "Canada - Nova Scotia Occupational Exposure Limits", "Canada - Prince Edward Island Occupational Exposure Limits", "Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)", "Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits", "Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances", "Canada Domestic Substances List (DSL)", "Canada Ingredient Disclosure List (SOR/88-64)", "Canada National Pollutant Release Inventory (NPRI)", "Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)", "International Council of Chemical Associations (ICCA) - High Production Volume List", "OECD Representative List of High Production Volume (HPV) Chemicals", "US - Alaska Limits for Air Contaminants", "US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which emissions must be quantified", "US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List", "US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)", "US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)", "US - California Permissible Exposure Limits for Chemical Contaminants", "US - California Toxic Air Contaminant List Category II", "US - Connecticut Hazardous Air Pollutants", "US - Hawaii Air Contaminant Limits", "US - Idaho - Acceptable Maximum Peak Concentrations", "US - Idaho - Limits for Air Contaminants", "US - Massachusetts Oil & Hazardous Material List", "US - Michigan Exposure Limits for Air Contaminants", "US - Minnesota Hazardous Substance List", "US - Minnesota Permissible Exposure Limits (PELs)", "US - New Jersey Right to Know Hazardous Substances", "US - Oregon Hazardous Materials", "US - Oregon Permissible Exposure Limits (Z-1)", "US - Oregon Permissible Exposure Limits (Z-2)", "US - Pennsylvania - Hazardous Substance List", "US - Rhode Island Hazardous Substances List", "US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants", "US - Vermont Hazardous Constituents", "US - Vermont Hazardous wastes which are Discarded Commercial Chemical Products or Off-Specification Batches of Commercial Chemical Products or Spill Residues of Either", "US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants", "US - Washington Dangerous waste constituents list", "US - Washington Discarded Chemical Products List - ""U"" Chemical Products", "US - Washington Permissible exposure limits of air contaminants", "US - Wyoming List of Highly Hazardous Chemicals, Toxics and Reactives", "US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants", "US - Wyoming Toxic and Hazardous Substances Table Z-2 Acceptable ceiling concentration, Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift", "US ACGIH Threshold Limit Values (TLV)", "US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)", "US CERCLA Priority List of Hazardous Substances", "US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances", "US Department of Homeland Security Chemical Facility Anti-Terrorism Standards - Chemicals of Interest", "US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US EPA Acute Exposure Guideline Levels (AEGLs) - Interim", "US EPA National Priorities List - Superfund Chemical Data Matrix (SCDM) - Hazard Ranking System - Hazardous Substance Benchmarks", "US Food Additive Database", "US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act", "US NFPA 45 Fire Protection for Laboratories Using Chemicals - Flammability Characteristics of Common Compressed and Liquefied Gases", "US NIOSH Recommended Exposure Limits (RELs)", "US OSHA List of Highly Hazardous Chemicals, Toxics and Reactives", "US OSHA Permissible Exposure Levels (PELs) - Table Z1", "US OSHA Permissible Exposure Levels (PELs) - Table Z2", "US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide", "US RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261", "US RCRA (Resource Conservation & Recovery Act) - List of Hazardous Wastes", "US SARA Section 302 Extremely Hazardous Substances", "US Toxic Substances Control Act (TSCA) - Inventory", "USA: Chemical Facility Anti-Terrorism Standards - List Appendix A - 6CFR 27", "WHO Guidelines for Drinking-water Quality - Chemicals for which guideline values have not been established"

#### methyl isothiocyanate (CAS: 556-61-6) is found on the following regulatory lists;

"Canada Domestic Substances List (DSL)", "FEMA Generally Recognized as Safe (GRAS) Flavoring Substances 23 - Primary Names and Synonyms", "US - Massachusetts Oil & Hazardous Material List", "US - New Jersey Right to Know Hazardous Substances", "US - Pennsylvania - Hazardous Substance List", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US EPA Acute Exposure Guideline Levels (AEGLs) - Interim", "US EPA High Production Volume Program Chemical List", "US EPCRA Section 313 Chemical List", "US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act", "US SARA Section 302 Extremely Hazardous Substances", "US Toxic Substances Control Act (TSCA) - Inventory"

## Section 16 - OTHER INFORMATION

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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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