

INTECH ORGANICS LTD

MATERIAL SAFETY DATA SHEET

Product Name Methyl Bromide 100%

Product Name: INBROM-100%

1. IDENTIFICATION OF THE SUBSTANCE & THE COMPANY

CHEMICAL NAME: Methyl bromide
SYNONYM(S): Bromomethane, MBr
CHEMICAL FAMILY Halogenated alkane
MOLECULAR WEIGHT 94.94
TYPE OF PRODUCT AND USE A broad-spectrum pesticide widely used as a powerful fumigant.

COMPANY

Intech Organics Ltd.
 33/1A, Dhargal Industrial
 Estate, Dhargal, Pernem, Goa-
 403513 Tel +91-832-2240819

Emergency telephone number: +91-832-2240819 91-832-2240919

2. COMPOSITION / INFORMATION ON INGREDIENTS

| Components CAS | Weight % | Annex No | . EEC No | . EU Classification | Notes |
|---------------------------|----------|----------------|-----------|--|-------|
| METHYL BROMIDE 74-83-9 | 100 | # 602-002-00-2 | 200-813-2 | Muta. Cat.3; R68 N; R50 N; R59 T; R23/25 Xi; R36/37/38 Xn; R48/20 | - |

3. HAZARDS IDENTIFICATION

ADVERSE HUMAN HEALTH EFFECTS

Methyl bromide may be fatal if inhaled and harmful if swallowed or absorbed through the skin. It is a neurotoxin and a severe irritant to the upper and lower respiratory tract, skin and eyes.

EYE CONTACT Irritation,

SKIN CONTACT May cause skin burns rashes and skin itching

INHALATION Extremely toxic, headache, fatigue, nausea, dizziness, tremors, restlessness.

INGESTION Ingestion causes burns and boils in mouth and throat

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NFPA Ratings (Scale 0-4)

Health = 3, Fire = 1, Reactivity = 0.

0= No Hazard
1=Slightly Hazard 2=
Moderate Hazard 3=
Serious Hazard 4=
Severe Hazard

4. FIRST-AID MEASURES

A 24-HOUR MEDICAL SURVEILLANCE PERIOD IS MANDATORY IN ALL CASES OF EXPOSURE TO METHYL BROMIDE, EVEN IN THE ABSENCE OF ANY IMMEDIATE SIGNS OF POISONING.

EYE CONTACT

Holding the eyelids apart, flush eyes promptly with copious flowing water for at least 20 minutes. Get medical attention immediately.

SKIN CONTACT

Wash skin thoroughly with mild soap and plenty of water for at least 15 minutes. Get medical attention immediately. All leather items should be discarded. Other contaminated clothing must either be discarded or thoroughly ventilated and washed before re-use.

INHALATION

In case of inhalation, remove person to fresh air. Keep him quiet and warm. Apply artificial respiration if necessary and get medical attention immediately.

INGESTION

If swallowed, wash mouth thoroughly with plenty of water. Get medical attention immediately.

* NOTE: Never give an unconscious person anything to drink.

NOTES TO THE PHYSICIAN

Signs and symptoms of toxicity are primarily referable to the CNS, respiratory tract and the cardiovascular system. **NO SPECIFIC ANTIDOTE.**

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5. FIRE - FIGHTING MEASURES

FLASH POINT None

FLAMMABLE/EXPLOSION LIMITS

- Lower Explosion Limit (% vol) 10
- Upper Explosion Limit (% vol) 16

AUTO-IGNITION TEMPERATURE 537°C

SUITABLE EXTINGUISHING MEDIA Carbon dioxide, dry chemicals, foam, water spray (fog).

FIRE FIGHTING PROCEDURE

Wear self-contained breathing apparatus in positive pressure mode and appropriate protective clothing. If possible stop material flow immediately. Do not extinguish burning gas unless flow can be shut off immediately. Use water spray, fog nozzle or CO2 to keep cylinder cool. If there is no risk, move cylinder away from fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Although it is considered practically nonflammable, methyl bromide can be ignited with a high energy source of ignition. Containers may rupture violently if exposed to fire or excessive heat for sufficient time. In confined spaces such as buildings or sewers, there is a danger of vapour accumulation, which may result in explosion in the presence of an ignition source. When heated to decomposition, may release poisonous and corrosive fumes of CO and HBr.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Evacuate area and keep personnel upwind.
Wear self-contained breathing apparatus in positive pressure mode.

METHODS FOR CLEANING UP

If practicable, Stop flow of vapour.
Ventilate and/or allow to evaporate, keeping people away from the area until safe re-entry levels are shown by halide detector.

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7. HANDLING AND STORAGE

HANDLING

Avoid bodily contact. Use an appropriate monitoring instrument for methyl bromide in any area where it is being stored or handled. Move and transport containers with requisite care. Do not use hooks, rope sling, etc. to unload. Use hand or fork trucks to firmly cradle cylinders.

STORAGE

Do not bump or drag them.

Store cylinders and cans upright, in a secure manner, either outdoors under ambient conditions, or indoors in a well ventilated area, away from seeds, foods/feed-stuffs and human and animal habitation.

Post as a pesticide storage area. Test periodically for leaks by halide leak detector.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS:

| Components CAS | ACGIH-TLV Data | OSHA (PEL) Data |
|---------------------------|-----------------|---|
| METHYL BROMIDE 74-83-9 | 1 ppm skin , A4 | C 20 ppm (C 80 mg/m ³),skin |

VENTILATION REQUIREMENTS

Ventilation must be sufficient to maintain atmospheric concentration below exposure limit. Mechanical ventilation is recommended. Use local exhaust at source of vapour.

PERSONAL PROTECTIVE EQUIPMENT:

- RESPIRATORY PROTECTION

For escape -

Gas mask with a new organic vapour canister. For any detectable concentration - Self-contained breathing apparatus or supplied-air respirator with a full face-piece.

- HAND PROTECTION

DO NOT WEAR GLOVES when working with MBr because of the danger that liquid or concentrated vapour may be trapped inside them.

- EYE PROTECTION

Splash-proof safety glasses CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH THIS CHEMICAL.

- SKIN AND BODY PROTECTION

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HYGIENE MEASURES

No specially designed protective clothing is available. Do not wear impervious boots, finger rings or adhesive bandages on hands when handling this material.

When using this material, do not eat, drink or smoke. Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE Colourless gas. Clear, colourless to Strawcoloured liquid under pressure or below 3.5°C.

SPECIFIC GRAVITY 1.710

MELTING POINT/RANGE -93.6 °C

BOILING POINT/RANGE 3.6°C

SOLUBILITY: Soluble in ethanol, benzene, carbon disulfide, and in water

SOLUBILITY IN WATER 0.132 gr/100ml at 25°C (partial pressure CH₃Br - 73 torr) 0.138 gr/100ml at 25°C (partial pressure CH₃Br - 108 torr)

- **ODOUR THRESHOLD** 20.6 ppm

DECOMPOSITION TEMPERATURE 400°C

PARTITION COEFFICIENT (N-OCTANOL/WATER) Log Kow - ~1.92

GASEOUS PHASE

GAS DENSITY (15°C and 1 bar) : 4.064 kg/m³

SPECIFIC GRAVITY (AIR = 1) (1.013 bar and 21 °C (70 °F)) : 3.3

SPECIFIC VOLUME (1.013 bar and 21 °C (70 °F)) : 0.256 m³/kg

HEAT CAPACITY AT CONSTANT PRESSURE (CP) (1.013 bar and 25 °C (77 °F)) : 0.043 kJ/(mol.K)

VAPOUR PRESSURE 1420 torr @ 20°C

VAPOR DENSITY 3.3 (20°C) (Air = 1)

10. STABILITY AND REACTIVITY

STABILITY Stable in sealed containers and under normal conditions

MATERIALS TO AVOID Strong oxidizers, aluminum, tin, zinc and magnesium metals and their alloys,

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natural rubber and certain types of plastics

CONDITIONS TO AVOID Keep away from ignition sources Avoid contamination by water

HAZARDOUS DECOMPOSITION PRODUCTS : CO, HBr, Carbonyl Bromide

HAZARDOUS POLYMERIZATION Will not occur

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY:

- **Rat oral LD50** liquid MBr in corn oil - 104 mg/kg microen capsulated MBr in corn oil - 133 mg/kg

- **RAT INHALATION LC50** 1175 mg/m³/8 hour

- **MOUSE INHALATION LC50** 1540 mg/m³/2 hour

EFFECTS OF OVEREXPOSURE :

- **Ocular** Severe irritant
Contact with liquid or high concentrations of gas with the eyes may cause severe but usually reversible injury involving temporary blindness.
- **DERMAL** Liquid splashed on clothing or leather or high gas concentrations held in contact with skin may cause skin burns with large blisters appearing after several hours. Less severe exposures may cause itching skin rash even after several days. May be absorbed through the skin in sufficient amount to cause systemic toxicity.
- **INHALATION** Acute poisoning from methyl bromide is characterized by marked irritation to the respiratory tract which may lead, in severe cases, to pulmonary edema. High concentrations may damage the liver, kidneys and central nervous system. Symptoms of poisoning include headache, dizziness, somnolence, vertigo, blurred vision, slurred speech, nausea and vomiting and possibly convulsions and coma.

ONSET OF TOXIC SYMPTOMS MAY BE DELAYED FROM 30 MINUTES TO SEVERAL DAYS.

- **INGESTION** Severe irritant to mucous membranes and toxic poison if ingested, although ingestion is highly unlikely.

CHRONIC TOXICITY Chronic exposure to low concentrations of methyl bromide may produce central nervous system effects. Signs include mental confusion, lethargy, inability to focus one's eye, incoordination and muscle weakness. Repeated skin contact may cause dermatitis.

MUTAGENICITY Mutagenic by the Ames Test
MBr induced DNA damage in rat testis following inhalation exposure at 250 ppm (6 hours/day for 5 consecutive days).
In vivo, MBr induced sister chromatid exchanges in bone marrow cells and micronuclei in peripheral erythrocytes of female mice exposed by inhalation for 14 days.

CARCINOGENICITY Studies conducted with MBr, exposing animals both by inhalation (rats & mice) and by oral route (fumigated feed, rats), showed that THERE WAS NO EVIDENCE OF CARCINOGENIC ACTIVITY.

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Not included in NTP 11th Report on Carcinogens.

OTHER

Single exposure vapour inhalation neurotoxicity study in rats:

---NOEL - 100 ppm

Acute oral toxicity (single dose) study in Beagle dogs:

---Lethal dose - 500 mg/kg

---No clinical signs were observed at 1 mg/kg

12. ECOLOGICAL INFORMATION

INFORMATION ON ECOLOGICAL EFFECTS

Methyl bromide is listed in the Montreal Protocol as a controlled substance with an ODP (Ozone Depleting Potential) of 0.6.

AQUATIC TOXICITY :

- **96 Hour-LC50, Fish** 3.9 mg/l (Rainbow Trout) 56.28 mg/l (Zebrafish)

- **48 Hour-EC50, Daphnia magna** 2.6 mg/l

- **72 Hour-EC50, Freshwater algae** 5 mg/l (Selenastrum capricornutum)

AVIAN TOXICITY:

- **Oral LD50** ca. 73 mg/kg (Northern Bobwhite)

PERSISTENCE AND DEGRADABILITY

- **Hydrolysis** Under laboratory conditions
(MBr) Half-life at pH 5 - 256.7 hours

Half-life at pH 7 - 253.9 hours

Half-life at pH 9 - 357.3 hours

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

Observe all federal, state and local environmental regulations when disposing of this material. The recommended method is incineration. If a suitable designated combustion chamber is not available, return MARKED containers to supplier. Contact local and/or state environmental authorities to insure proper compliance.

14. TRANSPORTATION INFORMATION

UN No. 1062

IMO Proper shipping name: Methyl bromide

Class: 2.3 Toxic Gases

Label: TOXIC GAS (2)

ADR/RID

Proper shipping name: Methyl bromide

Class 2 : Gases

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| ICAO/IATA | Classification Code: 2T Label No.: 2.3+13(RID) Hazard identification No. 26 Proper shipping name: Methyl bromide Class: 2.3 Cargo aircraft - Forbidden |
| DOT | Passenger aircraft - Forbidden Proper shipping name: Methyl bromide Hazard Class 2.3: Poisonous gas Label: POISON GAS (2.3) Shipping description: Inhalation Hazard; Hazard Zone C Emergency Guide No.123 |

15. REGULATORY INFORMATION

EU Regulated under EC Directive no.2037/2000 on substances that deplete the ozone layer.

EEC No. 200-813-2

- **Indication of danger** Very Toxic, symbol required (T+)
Dangerous for the environment, symbol required (N) Mutagenic Cat. 3

- R Phrases

R 25: Toxic if swallowed.
R 26: Very toxic by inhalation.
R 36/37/38 :Irritating to eyes, respiratory system and skin.
R 48/20: Harmful: danger of serious damage to health by prolonged exposure through inhalation
R 50 : Very toxic to aquatic organisms.
R59 :Dangerous to the ozone layer
R 68: Possible risk of irreversible effects

- S Phrases

S 1/2 :Keep locked up and out of reach of children.
S 13 :Keep away from food, drink and animal feeding stuffs.
S 15 :Keep away from heat.
S 20/21: W hen using, do not eat, drink or smoke.
S 23 :Do not breathe gas/fumes/vapour/spray
S 27 :Take off immediately all contaminated clothing.
S 36/39 :Wear suitable protective clothing and eye/face protection.
S 38: In case of insufficient ventilation,wear suitable respiratory equipment.
S45: In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).
S 59 :Refer to manufacturer/supplier for information on recovery/recycling.
S61: Avoid release to the environment.

For Italy T - Toxic.
Dangerous for the environment, symbol required (N)
Mutagenic Cat. 3
R23/25 - Toxic by inhalation and if swallowed
R36/37/38 - Irritating to eyes, respiratory system and skin
R48/20 - Harmful:danger of serious damage to health by prolonged exposure through inhalation

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R50 - Very toxic to aquatic organisms
 R59 - Dangerous to the ozone layer
 R68 - Possible risk of irreversible effects
 S1/2 - Keep locked up and out of reach of children
 S13 - Keep away from food, drink and animal feeding stuffs
 S15 - Keep away from heat
 S20/21 - When using, do not eat, drink or smoke
 S23 - Do not breathe gas/fumes/vapour/spray
 S27 - Take off immediately all contaminated clothing
 S36/39 - Wear suitable protective clothing and eye/face protection
 S38 - In case of insufficient ventilation, wear suitable respiratory equipment
 S45 - In case of accident or if you feel unwell, seek medical advice immediately
 (show label where possible)
 S59 - Refer to manufacturer/supplier for information on recovery/recycling
 S61 - Avoid release to the environment. Refer to special instructions/Safety data sheets

Australia Listed in AICS

USA Reported in the EPA TSCA Inventory This product is subject to registration under FIFRA

Canada Listed in DSL
 This substance is listed under Part 1, Group 1 Substances in the National Pollutant Release Inventory (NPRI) for 2005. Information about this substance must be reported to the Minister of the Environment in accordance with subsection 46(1) of the Canadian Environmental Protection Act, 1999. This chemical is included on the current phase-out schedule of ozone-depleting substances under the Canadian Environmental Protection Act, 1999.

Japan Listed in MITI (ENCS No.2-39, 2-199)

China inventory Listed

Hong Kong Dangerous Goods - Category 2 - Compressed Gases
 Ozone Depleting Substances - Part 6 scheduled substance

Korea Listed in ECL (KE-03676, KE-34085)
 Toxic chemical No.97-1-113, 1% or more in mixtures (MBr)
 Toxic chemical No.97-1-283, 1% or more in mixtures (CP) ;
 Prohibited Chemicals 99-4-30, 1% or more in mixtures (CP)

Switzerland Listed in Giftliste 1 (G-2062, G-1417)

Philippines Listed in PICCS

Taiwan Harmful substances

16. Material Compatibility

Metals

General Behavior Corrosive in presence of moisture

Aluminium :Non recommended
Brass :Satisfactory
Copper :Satisfactory
Ferritic Steels (e.g. Carbon steels) :Satisfactory but corrosive in presence of moisture.
Stainless Steel :Satisfactory but corrosive in presence of moisture except for high quality

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17. OTHER INFORMATION

Health, Safety & Environment Policy

We will endeavor to ensure that our operations and products meet the needs of the present global community without compromising in quality of product .We accept that the success of our business is dependent on the supply of products and services that will benefit society whilst ensuring human safety and protection of the environment and natural resources, We ensure healthy and safe work environment for employees and whilst maintaining high production standards of operation

NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE, ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH THE INFORMATION REFERS.

END OF SAFETY DATA SHEET

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