Methyl Bromide 98%

Product name: Methyl Bromide
Product id: 8326-98LYG
Supersedes: 26/10/2008
Revision date: 14/11/2011
Revision: 6

1. Identification of the substance & the company

Chemical name: Methyl bromide
Synonym(s): Bromomethane, MBr
Chemical formula: CH₃Br
Molecular weight: 94.94
Chemical family: Halogenated alkane
Type of product and use: A broad-spectrum pesticide widely used as a powerful fumigant.
Supplier:
Lianyungang Dead Sea Bromine Compounds Co., Ltd.
Banqiao Industrial Park, Lianyun district, Lianyungang, JiangSu, China 222066
Tel. 86-518-82323651 Fax: 86-518-8225395
Emergency telephone number: +86-518-2303760/2303504

2. 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. This product contains 2% chloropicrin (trichloronitromethane), which is used as a lachrymatory warning agent, and at this level does not affect the properties of the product, except for its odour.

GHS
GHS classification:
Press. Gas
Muta. 2 H341
Acute Tox. 2 H330
Acute Tox. 3 H301
Eye Irrit. 2 H319
Skin Irrit. 2 H315
STOT SE 3 H335
STOT RE 2 H373
Aquatic Acute 1 H400
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Label elements

Signal word: Danger

Hazard statements
- H341 - Suspected of causing genetic defects
- H331 - Toxic if inhaled
- H301 - Toxic if swallowed
- H319 - Causes serious eye irritation
- H335 - May cause respiratory irritation
- H315 - Causes skin irritation
- H373 - May cause damage to organs through prolonged or repeated exposure by inhalation.
- H400 - Very toxic to aquatic life
- EUH 059 Hazardous to the ozone layer

Precautionary statements
- P202 - Do not handle until all safety precautions have been read and understood.
- P260 - Do not breathe fume/gas/mist/vapours/spray
- P284 + P280 - Wear respiratory protection/protective clothing/eye protection/face protection.
- P304 + P340- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
- P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- P302 + P352 - IF ON SKIN: Wash with plenty of soap and water.
- P310 - Immediately call a POISON CENTER or doctor/physician
- P330- Rinse mouth.

NFPA Ratings (Scale 0-4)
- Health = 3, Fire = 1, Reactivity = 0

3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>Weight %</th>
<th>Index No.</th>
<th>EC No.</th>
<th>EU Classification</th>
</tr>
</thead>
</table>

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<tr>
<th>Product name</th>
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</tr>
</thead>
</table>

| Methyl Bromide 98% |                      | 98          | # 602-002-00-2 | 200-813-2 | Press. Gas | Muta. 2 H341 | Acute tox. 3 H301 | Acute tox. 3 H331 | STOT RE 2 H373 | Eye irrit. 2 H319 | STOT SE H335 | Skin irrit. 2 H315 | Aquatic acute 1 H400 | Ozone EUH059 | (In accordance with CLP 1272/2008) | Muta. Cat.3; R68 | N; R50 | N; R59 | T; R23/25 | Xi; R36/37/38 | Xn; R48/20 (In accordance with DSD 67/548/EEC) |
| 74-83-9            |                     |             |              |            |           |               |                      |                        |                   |                       |                 |                         |                          |               |                             |                      |      |      |        |          |                |

| TRICHLORONITRO METHANE | 76-06-2 | 2 | # 610-001-00-3 | 200-930-9 | Acute tox. 2 H330 | Acute tox. 4 H302 | Eye irrit. 2 H319 | STOT SE H335 | Skin irrit. 2 H315 | (In accordance with CLP 1272/2008) | T+; R26 | Xi; R36/37/38 | Xn; R22 (In accordance with DSD 67/548/EEC) |
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.  

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NOTE: Never give an unconscious person anything to drink.

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**Notes to the physician**  
Intense vesicant.  
Signs and symptoms of toxicity are primarily referrable to the CNS, respiratory tract and the cardiovascular system.  
No specific antidote.
5. Fire - fighting measures

Suitable extinguishing media
Carbon dioxide, dry chemicals, foam, water spray (fog).
In case of exothermic decomposition and appearance of smoke, water should be used to suppress it.

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.
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. Do not bump or drag them.

Storage
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:

<table>
<thead>
<tr>
<th>Components</th>
<th>Weight %</th>
<th>ACGIH-TLV Data</th>
<th>Netherlands national MAC data</th>
<th>UK (WEL) - TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHYL BROMIDE</td>
<td>98</td>
<td>1 ppm skin, A4</td>
<td>0.3 ppm (1 mg/m³), skin</td>
<td>6 ppm (20 mg/m³) STEL -15 ppm (59 mg/m³), 10 min</td>
</tr>
<tr>
<td>TRICHLORONITRO METHANE</td>
<td>2</td>
<td>0.1 ppm, A4</td>
<td>0.1 ppm (0.7 mg/m³)</td>
<td>0.1 ppm (0.7 mg/m³) STEL -0.3 ppm (2 mg/m³), 10 min</td>
</tr>
</tbody>
</table>

Ventilation requirements
Ventilation must be sufficient to maintain atmospheric concentration below recommended 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.
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- Skin and body protection
  No specially designed protective clothing is available.
  Do not wear gloves, impervious boots, finger rings or adhesive bandages on hands
  when handling this material.

Hygiene measures
  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, with a sharp, penetrating odour. Clear, colourless to straw-coloured
  liquid under pressure or below 3.5°C.

Boiling point/range
  3.5-4°C

Melting point/range
  -94°C

Flash point
  None

Flammable/Explosion limits
  - Lower (% vol) 10
  - Upper (% vol) 16

Auto-ignition temperature
  537°C

Vapour pressure
  1420 mmHg (20°C)

Evaporation rate (ether=1) >1

Vapor density
  3.3 (20°C)

Viscosity
  Not available

Solubility:
  - 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)

- Solubility in other solvents
  Infinitely soluble in most organic solvents

pH
  Not available

Decomposition temperature
  400°C

Partition coefficient
  Log Kow - ~1.92

(n-octanol/water)

Explosive properties
  Not available

Oxidising properties
  Not available
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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, natural rubber and certain types of plastics.
Conditions to avoid: Keep away from ignition sources Avoid contamination by water

Hazardous decomposition products: CO, HBr
Hazardous polymerization: Will not occur

11. Toxicological information

Acute toxicity:
- Rat oral LD50: liquid MBr in corn oil - 104 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.
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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.
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
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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)
- Oral LD50
  ~ 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

Germany, water endangering classes (WGK)
3

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)
Mark: MARINE POLLUTANT
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ADR/RID
Proper shipping name: Methyl bromide
Hazard identification No. 26
Class 2 : Gases
Label No.: 2.3+13(RID)
Classification Code: 2T
Marking: Environmentally hazardous substance

ICAO/IATA
Proper shipping name: Methyl bromide
Class: 2.3
Cargo aircraft - Forbidden
Passenger aircraft - Forbidden
Marking: Environmentally hazardous substance

DOT
Proper shipping name: Methyl bromide
Hazard Class 2.3: Poisonous gas
Label: POISON GAS (2.3)
Shipping description: Inhalation Hazard; Hazard Zone C
---RQ - 1000 lbs (MBr) Emergency Guide No.123
Marking: Marine Pollutant

15. Regulatory information

EU
Regulated under Article 22 of EC Regulation no.2037/2000 on substances that deplete the ozone layer.

EC 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
R 59 :Dangerous to the ozone layer
R 68: Possible risk of irreversible effects
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- 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: When 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.
  S 45: 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.
  S 61: Avoid release to the environment. Refer to special instructions/Safety data sheets.

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

Australia
Listed in AICS

Canada
Listed in DSL
This substance is listed under Part 1, Group 1 Substances in the National Pollutant Release Inventory (NPRI) for 2008. 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.

China inventory
Listed

Japan
ENCS no. 2-39 (Methyl bromide), 2-199 (Chloropicrin)
ISHL no. 2-39 (Methyl bromide), 2-199 (Chloropicrin)

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

Korea
Listed in ECL (No.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)

New Zealand Inventory
Listed in NZIoC

Philippines
Listed in PICCS
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16. Other information

This data sheet contains changes from the previous version in section(s)
2, 3, 5, 9, 10, 14

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End of safety data sheet