1. Identification of the substance & the company

Chemical name: A mixture of methyl bromide (MBr) and chloropicrin (CP)

Chemical formula: CH_3 Br (MBr) & CCl_3 NO_2 (CP)

Chemical family: A mixture of halogenated alkane and halogenated nitroalkane

Type of product and use: A broad-spectrum pesticide widely used as a powerful fumigant.

Supplier: Ameribrom, INC.
95 MacCorkle Ave. SW, South Charleston, WV 25303-1411, USA
Tel: (304) 720-3950
Fax: (304) 746-3101

Emergency Telephone: Chemtrec (800)424-9300

2. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>Weight %</th>
<th>ACGIH-TLV Data</th>
<th>OSHA (PEL) Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHYL BROMIDE 74-83-9</td>
<td>50</td>
<td>1 ppm skin , A4</td>
<td>C 20 ppm (C 80 mg/m^3),skin</td>
</tr>
<tr>
<td>TRICHLORONITRO METHANE 76-06-2</td>
<td>50</td>
<td>0.1 ppm, A4</td>
<td>0.1 ppm (0.7 mg/m^3)</td>
</tr>
</tbody>
</table>

3. Hazards identification

Emergency overview: Colourless to pale straw-coloured liquid/gas with a sharp, penetrating odour. Lachrymator

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.
MATERIAL SAFETY DATA SHEET

Product Name: Methyl Bromide-50%
Product id: 8326-50
Supersedes: 05/09/2004
Revision: 606/08/2007

Potential Health Effects:
- **Eye Contact**
  Lachrymator
  Severe irritant. Contact with liquid or high concentrations of gas with the eyes may cause severe but usually reversible injury involving temporary blindness.

- **Skin contact**
  Liquidsplashed 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 effects/Carcinogenicity**
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.

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

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

Lachrymator

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

Note:
The information refers only to methyl bromide. Chloropicrin is not flammable.

Flash point
None

Flammable/Explosion limits
- Lower (% vol) 10
- Upper (% 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. Chloropicrin is a strong oxidant, contact with combustible or reducing materials may cause fire and explosion. Above a critical volume it can be shock detonated. When heated to decomposition, may release poisonous fumes of CO, CO2, HBr, Cl2, NOx and HCl
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

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.

- 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.
MATERIAL SAFETY DATA SHEET

Product Name: Methyl Bromide-50%
Product id: 8326-50
Revision date: 06/08/2007

Hygiene measures: Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking. When using this material, do not eat, drink or smoke. Safety shower and eye bath should be provided.

9. Physical and chemical properties

Appearance: Colourless to pale straw-coloured liquid/gas with a sharp, penetrating odour.
Melting point/range: -94 °C (MBr) & -64 °C (CP)
Boiling point/range: > 3.5°C
Vapour pressure: 1420 mmHg (MBr) & 20 mmHg (CP) @ 20°C
Vapor density: 3.3 (MBr) & 5.7 (CP)
Evaporation rate (ether=1): Not available
Solubility:
- Solubility in water: Practically insoluble (MBr)
  0.162 gr/100ml at 25°C (CP)
- Solubility in other solvents: Infinitely soluble in most organic solvents
Density: 1.7 g/mL (4°C)
Partition coefficient: Log Kow - ~ 1.92 (MBr)
(n-octanol/water) Log Kow - 2.09 (CP)

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.
Avoid also reducing agents, combustible materials and sulfuric acid
Conditions to avoid: Keep away from ignition sources
Avoid contamination by water
Hazardous decomposition products: CO, HBr, Cl2, NOx, HCl, CO2
Hazardous polymerization: Will not occur
11. Toxicological information

Acute toxicity:
- Rat oral LD50  
  liquid MBr in corn oil - 104 mg/kg  
  microencapsulated MBr in corn oil - 133 mg/kg  
  CP - 250 mg/kg
- Rat inhalation LC50  
  MBr - 1175 mg/m³/8 hour
- Mouse inhalation LC50  
  CP - 66 mg/m³/4 hour  
  MBr - 1540 mg/m³/2 hour

Sub-chronic toxicity:  
- NOEL  
  0.67 ppm (13 weeks, inhalation, rat) - (CP)

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. Systemic poisoning by chloropicrin may damage the heart. Repeated skin contact may cause dermatitis.

Mutagenicity  
MBr and CP were found 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). CP was found clastogenic in sister chromatid exchange (8 mg/l). 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. Carcinogenesis bioassay (gavage) with CP: mouse - no evidence; rat - inadequate studies. Not classified by IARC. Not included in NTP 11th Report on Carcinogens.

Reproductive toxicity  
NIOSH concluded that methyl bromide did not have a teratogenic effect on either rats or rabbits. Reproduction studies showed that acute inhalation of methyl bromide does not adversely affect either spermatogenesis or sperm quality of rats.
MATERIAL SAFETY DATA SHEET

Product Name: Methyl Bromide-50%
Product id: 8326-50
Revision date: 06/08/2007
Supersedes: 05/09/2004
Revision: 6

Other

Single exposure vapour inhalation neurotoxicity study in rats: (MBr)
---NOEL - 100 ppm

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

Environmental fate

Photohydrolysis is an important environmental fate process for methyl bromide and chloropicrin. Volatility is a major mode for movement of methyl bromide from soil but not a major mode for movement of chloropicrin from soil.

Aquatic toxicity:

- 96 Hour-LC50, Fish
  56.28 mg/l (Zebrafish) - (MBr)
  3.9 mg/l (Rainbow trout) - (MBr)
  0.0165 mg/l (Rainbow trout) - (CP)

- 48 Hour-EC50, Daphnia magna
  2.6 mg/l (MBr)

- 48 Hours-LC50, Daphnia pulex
  0.08 mg/l (CP)

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

Avian toxicity:

- Oral LD50
  ~ 73 mg/kg (Northern Bobwhite) - (MBr)

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

Bioaccumulative potential

Both components are not likely to bioaccumulate due to low octanol/water partition coefficient
**13. Disposal considerations**

**Waste disposal**
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. Observe all federal, state and local environmental regulations when disposing of this material.

**Disposal of Packaging**
Return marked empty cylinders to supplier

**14. Transportation information**

**UN No.**
1581

**DOT**
Proper shipping name: Chloropicrin and methyl bromide mixture  
Hazard Class 2.3: Poisonous gas  
Label: POISON GAS (2.3)  
Shipping description: Inhalation Hazard; Hazard zone B  
---RQ - 1000 lbs (MBr)

**IMO**
Proper shipping name: Chloropicrin and methyl bromide, mixture  
Class: 2.3 Toxic Gases  
Label: TOXIC GAS (2)

**ICAO/IATA**
Class: 2.3  
Cargo aircraft - Forbidden  
Passenger aircraft - Forbidden

**15. Regulatory information**

**USA**
All the ingredients in this preparation are listed in the EPA TSCA Inventory. This product is subject to registration under FIFRA

**- California-Prop 65**
Under proposition 65, methyl bromide has been listed by the State of California as a reproductive toxin when used as a structural fumigant. When methyl bromide is used as a structural fumigant, the following labeling must be on the container:
"Warning: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm"
15. Regulatory information

Methyl bromide and chloropicrin (CAS nos. 74-83-9 & 76-06-2) are subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372.

Canada
Listed in DSL

EU
Reported in EINECS

Japanese METI
ENCS No.2-39, 2-199

Australia
Listed in AICS

New Zealand Inventory
Listed in NZIoC

Korea
Listed in ECL (KE-03676, KE-34085)

Philippines
Listed in PICCS

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

16. Other information

This data sheet contains changes from the previous version in section(s)
1(Not ANSI),2 , 8, 15

Health, Safety & Environment Policy
We will strive to ensure that our operations and products meet the needs of the present global community without compromising the ability of future generations to meet their needs

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

Within the framework of our commitment to the Responsible Care program, we will provide a healthy and safe work environment for employees and will responsibly manage our products at all stages of their life cycle in order to protect human health and the environment whilst maintaining high production standards of operation

TO MEET THIS COMMITMENT WE WILL:

Comply with or exceed applicable national and international regulatory requirements and other requirements to which we subscribe

Communicate openly and actively encourage dialogue with employees, customers and community concerning our products and operations

Implement documented management systems consistent with and for promotion of the Responsible Care ethics
Develop and supply products that can be manufactured, transported, used and disposed of safely whilst best meeting the needs of our customers
Regularly assess, continually improve and responsibly manage health, safety and environmental risks associated with products and processes throughout their life-cycles
Share knowledge and expertise with others and seek to learn from and incorporate improved practices into our own operations
Educate and train employees, contractors and customers to improve their HSE performance
Communicate up-to-date information to enable our workers, customers and other interested parties to handle our products in a safe and environmentally responsible manner
Endeavor to work with customers, suppliers, distributors and contractors to foster the safe use, transport and disposal of our chemicals
Support Product Stewardship programs in cooperation with customers, distributors and transporters

Although the information and recommendations set forth herein (hereinafter "information") are presented in good faith and believed to be correct as of the date hereof, Bromine Compounds Ltd. makes no representations as to the completeness or accuracy thereof.
Information is supplied upon the condition that the persons receiving same will make their own determination as to its safety and suitability for their purposes prior to use.
In no event will Bromine Compounds Ltd. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information.
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.

In an event of discrepancy between the contents of this MSDS and the English version of it, the English version shall prevail.

Prepared By
HSE Division in ISRAEL
telephone: +/972-8-6297830
telex: +/972-8-6297832
www.icl-ip.com
e-mail:msdsinfo@icl-ip.com

End of safety data sheet