Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Bromoform
Product Number: 132942
Brand: Aldrich
Supplier: Sigma-Aldrich
2683 Spruce Street
SAINT LOUIS MO 63103
USA.
Telephone: +1 800-325-5932
Fax: +1 800-325-5052
Emergency Phone # (For both supplier and manufacturer): (314) 776-5555
Preparation Information: Sigma-Aldrich Corporation
Product Safety - Americas Region
1-800-521-8056

2. HAZARDS IDENTIFICATION

Emergency Overview
OSHA Hazards
Target Organ Effect, Toxic by inhalation, Harmful by ingestion, Irritant, Carcinogen
Target Organs
Liver, Nerves, Kidney, Lungs, Heart
Other hazards which do not result in classification
Lachrymator.

GHS Classification
Acute toxicity, Oral (Category 4)
Acute toxicity, Inhalation (Category 2)
Skin irritation (Category 2A)
Eye irritation (Category 2A)
Acute aquatic toxicity (Category 2)
Chronic aquatic toxicity (Category 2)

GHS Label elements, including precautionary statements

Signal word: Danger
Hazard statement(s)
H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H331 Toxic if inhaled.
H411 Toxic to aquatic life with long lasting effects.
Precautionary statement(s)
P261 Avoid breathing dust/ fumes/ gas/ mist/ fumes/ spray.
P273 Avoid release to the environment.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Syonyms: Tribromomethane
Formula: CHBr3
Molecular Weight: 252.73 g/mol

Component: Bromoform
Concentration: 75-25-5
CAS-No.: 75-25-5
EC-No.: 200-854-6
Index-No.: 602-007-09-X

Component: Ethanol
Concentration: 64-17-5
CAS-No.: 64-17-5
EC-No.: 200-578-6
Index-No.: 603-002-06-5

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

Inhalation
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

Ingestion
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

Conditions of flammability
Not flammable or combustible.

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Special protective equipment for firefighters
Wear self-contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen bromide gas

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitably, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully ressealed and kept upright to prevent leakage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bromoform</td>
<td>75-22-2</td>
<td>TWA</td>
<td>0.5 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
</tbody>
</table>

Remarks
Upper Respiratory Tract & eye irritation. Liver damage. Confirmed animal carcinogen with unknown relevance to humans.

[Table continues]

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Form: liquid
Colour: no data available

Safety data
pH: no data available
Melting point/freezing point:
Boiling point:
Flash point:
Ignition temperature: no data available
Auto-ignition temperature: no data available
Lower explosion limit: no data available
Upper explosion limit  no data available
Vapour pressure 6.7 kPa (50 mmHg) at 20.0 °C (68.0 °F)
Density 2.89 g/cm³ at 25 °C (77 °F)
Water solubility no data available
Partition coefficient n-octanol/water no data available
Relative vapour density no data available
Odour no data available
Odour Threshold no data available
Evaporation rate no data available

10. STABILITY AND REACTIVITY
   Chemical stability
   Stable under recommended storage conditions.
   Possibility of hazardous reactions
   no data available
   Conditions to avoid
   no data available
   Materials to avoid
   Alkali metals
   Hazardous decomposition products
   Hazardous decomposition products formed under fire conditions - Carbon oxides, Hydrogen bromide gas
   Other decomposition products - no data available
   Contains the following stabiliser(s):
   Ethanol (1.1 - 3.3 %)

11. TOXICOLOGICAL INFORMATION
   Acute toxicity
   Oral LD50
   LD50 Oral - rat - 933.0 mg/kg
   Remarks: Lungs, Thorax, or Respiration: Dyspnea.
   Inhalation LC50
   LC50 Inhalation - Mammal - 12,100 mg/m³
   Dermal LD50
   no data available
   Other information on acute toxicity
   no data available
   Skin corrosion/irritation
   no data available
   Serious eye damage/eye irritation
   no data available
   Respiratory or skin sensitisation
   no data available
   Germ cell mutagenicity
   no data available
   Carcinogenicity
   This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

   IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (Bromoform)
   NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
   OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
   Reproductive toxicity
   no data available
   Teratogenicity
   no data available
   Specific target organ toxicity - single exposure (Globally Harmonized System)
   no data available
   Specific target organ toxicity - repeated exposure (Globally Harmonized System)
   no data available
   Aspiration hazard
   no data available
   Potential health effects
   Inhalation Toxic if inhaled. Causes respiratory tract irritation.
   Ingestion Harmful if swallowed.
   Skin Harmful if absorbed through skin. Causes skin irritation.
   Eyes Causes eye irritation.
   Signs and Symptoms of Exposure
   To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
   Synergistic effects
   no data available
   Additional information
   RTECS: PB600000
   12. ECOLOGICAL INFORMATION
   Toxicity
   Toxicity to fish LC50 - other fish - 7 mg/l - 96.0 h
   NOEC - Cyprinodon variegatus (sheephead minnow) - 2.9 mg/l - 96.0 h
   LC50 - Cyprinodon variegatus (sheephead minnow) - 7.1 mg/l - 96.0 h
   Toxicity to daphnia LC50 - Daphnia magna (Water flea) - 46 mg/l - 48 h
   and other aquatic invertebrates
   Persistence and degradability
   Biodegradability aerobic
   Result: 0 % - Not biodegradable.
Bioaccumulative potential
no data available

Mobility in soil
no data available

PET and vPvB assessment
no data available

Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 2515, Class: 6.1
Proper shipping name: Bromoform
Packing group: III
Reportable Quantity (RQ): 100 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 2515, Class: 6.1
Proper shipping name: BROMOFORM
Packing group: III
EMS-No: F-A, S-A
Marine pollutant: Marine pollutant

IATA
UN number: 2515, Class: 6.1
Proper shipping name: Bromoform
Packing group: III

15. REGULATORY INFORMATION

OSHA Hazards
Target Organ Effect, Toxic by inhalation., Harmful by ingestion., Irritant, Carcinogen

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>2007-03-01</td>
</tr>
<tr>
<td>Bromoform</td>
<td>75-25-2</td>
<td>2007-07-01</td>
</tr>
</tbody>
</table>

Pennsylvania Right To Know Components

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>2007-03-01</td>
</tr>
<tr>
<td>Bromoform</td>
<td>75-25-2</td>
<td>2007-07-01</td>
</tr>
</tbody>
</table>

16. OTHER INFORMATION

Further information
Copyright 2013 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.