SAFETY DATA SHEET
according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

SECTION 1. Identification

Product identifier
Product number  801786
Product name  Bromobenzene for synthesis
CAS-No.  108-86-1

Relevant identified uses of the substance or mixture and uses advised against
Identified uses  Chemical for synthesis

Details of the supplier of the safety data sheet
Company  EMD Millipore Corporation | 290 Concord Road, Billerica, MA 01821, United States of America | General Inquiries: +1-978-715-4321 | Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)

Emergency telephone  800-424-9300 CHEMTREC (USA)
+1-703-527-3887 CHEMTREC (International)
24 Hours/day; 7 Days/week

SECTION 2. Hazards identification

GHS Classification
Flammable liquid, Category 3, H226
Skin irritation, Category 2, H315
For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling

Hazard pictograms

Signal Word
Warning

Hazard Statements
H226 Flammable liquid and vapor.
H315 Causes skin irritation.

Precautionary Statements
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing.
Rinse skin with water/shower.
P321 Specific treatment (see supplemental first aid instructions on this label).
P332 + P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P235 Store in a well-ventilated place. Keep cool.
P501 Dispose of contents/container to an approved waste disposal plant.

Other hazards
None known.

SECTION 3. Composition/information on ingredients

Formula  C₆H₅Br (Hill)
Molar mass  157 g/mol

Hazardous ingredients

Chemical Name (Concentration)
CAS-No.
bromobenzene (>= 90% - <= 100%)
108-86-1
Exact percentages are being withheld as a trade secret.

SECTION 4. First aid measures

Description of first-aid measures

Inhalation
After inhalation: fresh air.

Skin contact
After skin contact: wash off with plenty of water. Remove contaminated clothing.

Eye contact
After eye contact: rinse out with plenty of water with the eyelid held wide open. Call in ophthalmologist if necessary.

Ingestion

Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed
irritant effects
agitation, Diarrhea, Vomiting, Headache, narcosis

**Indication of any immediate medical attention and special treatment needed**
No information available.

### SECTION 5. Fire-fighting measures

**Extinguishing media**

*Suitable extinguishing media*
- Water, Foam, Carbon dioxide (CO2), Dry powder

*Unsuitable extinguishing media*
For this substance/mixture no limitations of extinguishing agents are given.

**Special hazards arising from the substance or mixture**
- Combustible.
- Vapors are heavier than air and may spread along floors.
- Pay attention to flashback.
- Forms explosive mixtures with air at elevated temperatures.
- Development of hazardous combustion gases or vapors possible in the event of fire.
- Fire may cause evolution of:
  - hydrogen bromide

**Advice for firefighters**

*Special protective equipment for fire-fighters*
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

*Further information*
- Remove container from danger zone and cool with water. Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

### SECTION 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**
- Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.
- Advice for emergency responders: Protective equipment see section 8.

**Environmental precautions**
- Do not let product enter drains. Risk of explosion.

**Methods and materials for containment and cleaning up**
- Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

### SECTION 7. Handling and storage

**Precautions for safe handling**
Observe label precautions.

*Advice on protection against fire and explosion*
Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

**Conditions for safe storage, including any incompatibilities**
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Store at +15°C to +25°C (+59°F to +77°F).

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**SECTION  8. Exposure controls/personal protection**

**Exposure limit(s)**
Contains no substances with occupational exposure limit values.

**Engineering measures**
Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

**Individual protection measures**
Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

**Hygiene measures**
Immediately change contaminated clothing. Apply skin-protective barrier cream. Wash hands and face after working with substance.

**Eye/face protection**
Safety glasses

**Hand protection**
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

**Other protective equipment:**
Flame retardant antistatic protective clothing.

**Respiratory protection**
required when vapors/aerosols are generated.
Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

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**SECTION  9. Physical and chemical properties**

<table>
<thead>
<tr>
<th>Physical state</th>
<th>liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>colorless</td>
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<tr>
<td>Odor</td>
<td>aromatic</td>
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<tr>
<td>Odor Threshold</td>
<td>No information available.</td>
</tr>
</tbody>
</table>
pH  
No information available.

Melting point  
-31 °C

Boiling point/boiling range  
313 °F (156 °C) at 1,013 hPa

Flash point  
124 °F (51 °C)  
Method: c.c.

Evaporation rate  
No information available.

Flammability (solid, gas)  
No information available.

Lower explosion limit  
0.5 %(V)

Upper explosion limit  
2.5 %(V)

Vapor pressure  
13 hPa  
at 104 °F (40 °C)

4 hPa  
at 68 °F (20 °C)

Relative vapor density  
No information available.

Density  
1.49 g/cm³  
at 68 °F (20 °C)

Relative density  
No information available.

Water solubility  
0.45 g/l  
at 86 °F (30 °C)

Partition coefficient: n-octanol/water  
log Pow: 2.99 (20 °C)  
(experimental)  
(Lit.) Bioaccumulation is not expected.

Autoignition temperature  
No information available.

Decomposition temperature  
No information available.

Viscosity, dynamic  
1.124 mPa.s  
at 68 °F (20 °C)

Explosive properties  
Not classified as explosive.

Oxidizing properties  
none

Ignition temperature  
1049 °F (565 °C)
SECTION 10. Stability and reactivity

Reactivity
Vapor/air-mixtures are explosive at intense warming.

Chemical stability
The product is chemically stable under standard ambient conditions (room temperature).

Possibility of hazardous reactions
Violent reactions possible with:
- Oxidizing agents, peroxi compounds, Alkali metals, Alkaline earth metals

Conditions to avoid
- Heating.
- A range from approx. 15 Kelvin below the flash point is to be rated as critical.

Incompatible materials
- no information available

Hazardous decomposition products
- in the event of fire: See section 5.

SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure
- Inhalation, Eye contact, Skin contact

Acute oral toxicity
LD50 Rat: 2,383 mg/kg (RTECS)

Symptoms: Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract., Aspiration may cause pulmonary edema and pneumonitis.

Acute inhalation toxicity
LC50 Rat: 20.4 mg/l (RTECS)

Symptoms: Inhalation may lead to the formation of oedemas in the respiratory tract.

Skin irritation
Causes skin irritation.

Eye irritation
slight irritation

Genotoxicity in vitro
Mutagenicity (mammal cell test): chromosome aberration.
Result: negative
(National Toxicology Program)

Specific target organ systemic toxicity - single exposure
The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific target organ systemic toxicity - repeated exposure
The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
Aspiration hazard

Regarding the available data the classification criteria are not fulfilled.

Carcinogenicity

IARC
No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA
No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP
No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

ACGIH
No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Further information

After absorption of large quantities:
Systemic effects:
Headache, Vomiting, Diarrhea, agitation, narcosis
Absorption can result in damage to:
Liver, Kidney
Further data:
Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

Ecotoxicity

Toxicity to fish
LC50 Pimephales promelas (fathead minnow): 5.6 mg/l; 96 h  (ECOTOX Database)

Toxicity to daphnia and other aquatic invertebrates
EC50 Daphnia magna (Water flea): 1.6 mg/l; 24 h  (ECOTOX Database)

Persistence and degradability

Biodegradability
0 %; 28 d  
(HSDB)
Not readily biodegradable.

Bioaccumulative potential

Partition coefficient: n-octanol/water
log Pow:  2.99 (20 °C)  
(experimental)
(Lit.) Bioaccumulation is not expected.

Mobility in soil
No information available.
Other adverse effects

Henry constant
250 Pa·m³/mol
(Lit.) Distribution preferentially in air.

Additional ecological information
Discharge into the environment must be avoided.

SECTION 13. Disposal considerations
The information presented only applies to the material as supplied. The identification based on characteristic(s)
or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the
waste generator to determine the toxicity and physical properties of the material generated to determine the
proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be
in accordance with applicable regional, national and local laws and regulations.

SECTION 14. Transport information

Land transport (DOT)
UN number UN 2514
Proper shipping name BROMOBENZENE
Class 3
Packing group III
Environmentally hazardous --

Air transport (IATA)
UN number UN 2514
Proper shipping name BROMOBENZENE
Class 3
Packing group III
Environmentally hazardous --
Special precautions for user no

Sea transport (IMDG)
UN number UN 2514
Proper shipping name BROMOBENZENE
Class 3
Packing group III
Environmentally hazardous --
Special precautions for user yes
EmS F-E S-D

SECTION 15. Regulatory information

United States of America

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

Clean Water Act
This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

DEA List I
Not listed

DEA List II
Not listed

US State Regulations

Massachusetts Right To Know
Ingredients
bromobenzene

Pennsylvania Right To Know
Ingredients
bromobenzene

New Jersey Right To Know
Ingredients
bromobenzene

California Prop 65 Components
This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status
TSCA: All components of the product are listed in the TSCA-inventory.

DSL: All components of this product are on the Canadian DSL.

SECTION 16. Other information

Training advice
Provide adequate information, instruction and training for operators.

Labeling
Hazard pictograms

![Hazard Pictograms]
Signal Word
Warning

Hazard Statements
H226 Flammable liquid and vapor.
H315 Causes skin irritation.
H411 Toxic to aquatic life with long lasting effects.

Precautionary Statements
Prevention
P210 Keep away from heat.
P273 Avoid release to the environment.
Response
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P313 Get medical advice/attention.

Full text of H-Statements referred to under sections 2 and 3.
H226 Flammable liquid and vapor.
H315 Causes skin irritation.

Key or legend to abbreviations and acronyms used in the safety data sheet
Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Revision Date 09/16/2014

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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