



MATERIAL SAFETY DATA SHEET

(S)-Bromo-enol lactone

Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108

Revision: 11/08/2011
Supersedes Revision: 05/26/2009

1. Identification of the Substance/Mixture and of the Company/Undertaking

Product Code: 10006801
Product Name: (S)-Bromo-enol lactone
Manufacturer Information
Company Name: Cayman Chemical Company
Emergency Contact: CHEMTREC Within USA and Canada: +1 (800)424-9300
Alternate Emergency Contact: CHEMTREC Outside USA and Canada: +1 (703)527-3887
Information: Cayman Chemical Company +1 (734)971-3335
Web site address: www.caymanchem.com
Synonyms: 6E-(bromoethylene)tetrahydro-3S-(1-naphthalenyl)-2H-pyran-2-one; (S)-BEL;

2. Hazards Identification

Emergency Overview: Highly Flammable.
Irritant.
Target Organ(s): central nervous system, eyes, kidneys, respiratory system.
Route(s) of Entry: Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection
Potential Health Effects (Acute and Chronic): Material may be irritating to the mucous membranes and upper respiratory tract.
May be harmful by inhalation, ingestion, or skin absorption.
May cause eye, skin, or respiratory tract irritation.
Repeated exposure may cause skin dryness or cracking.
LD 50 / LC 50: Please refer to Section 11.
Signs and Symptoms Of Exposure: Inhalation may cause coughing, drowsiness, dizziness, dullness, and headache.
To the best of our knowledge, the toxicological properties have not been thoroughly investigated.
Medical Conditions Generally Aggravated By Exposure: No data available.

3. Composition/Information on Ingredients

| Hazardous Components (Chemical Name) | CAS # | Concentration | EC# | Risk Phrases | RTECS # |
|--------------------------------------|-------------|---------------|-----------|-------------------|-----------|
| 1. (S)-Bromo-enol lactone | 478288-94-7 | 1.0 % | NA | No phrases apply. | NA |
| 2. Methyl acetate | 79-20-9 | 99.0 % | 201-185-2 | R11-36-66-67 | AI9100000 |

4. First Aid Measures

Emergency and First Aid Procedures:
If inhaled, remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.
If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.
In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water for at least 20 minutes. Have eyes examined and tested by medical personnel.
In case of skin contact, immediately wash skin with soap and plenty of water for at least 20 minutes. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

5. Fire Fighting Measures

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| Flash Pt: | -10.00 C Method Used: Closed Cup |
| Explosive Limits: | LEL: 3.1% at 25.0 C UEL: 16% at 25.0 C |
| Autoignition Pt: | 455.00 C |
| Fire Fighting Instructions: | As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes. Note: Flammable as diluted in methyl acetate. |
| Flammable Properties and Hazards: | Can release vapors that form explosive mixtures at temperatures at or above the flash point. Container explosion may occur under fire conditions. Emits toxic fumes under fire conditions. Sensitive to static discharge. Vapors can travel to a source of ignition and flash back. |
| Hazardous Combustion Products: | No data available. |
| Suitable Extinguishing Media: | Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray. Use water spray to cool fire-exposed containers. |
| Unsuitable Extinguishing Media: | A solid water stream may be inefficient. |

6. Accidental Release Measures

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| Steps To Be Taken In Case Material Is Released Or Spilled: | Avoid release into the environment. Avoid breathing vapors and provide adequate ventilation. Remove all sources of ignition. As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves). Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. |
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7. Handling and Storage

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| Hazard Label Information: | Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation. Wash thoroughly after handling. |
| Precautions To Be Taken in Handling: | Avoid breathing (dust, vapor, mist, gas). Avoid prolonged or repeated exposure. Keep away from sources of ignition. Prevent the build up of electrostatic charge. |
| Precautions To Be Taken in Storing: | Keep away from heat, sparks, and flame. Keep tightly closed. Store at correct temperature. |
| Other Precautions: | Protect from moisture. |

8. Exposure Controls/Personal Protection

| Hazardous Components (Chemical Name) | CAS # | OSHA PEL | ACGIH TWA | Other Limits |
|--------------------------------------|-------------|--------------|-------------------------------|--------------|
| 1. (S)-Bromoenol lactone | 478288-94-7 | No data. | No data. | No data. |
| 2. Methyl acetate | 79-20-9 | PEL: 200 ppm | TLV: 200 ppm STEL: 250 ppm | No data. |

| | |
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| Protective Equipment Summary - Hazard Label Information: | Compatible chemical-resistant gloves Eye wash station in work area Lab coat Safety glasses Safety shower in work area Vent Hood |
| Respiratory Equipment (Specify Type): | NIOSH approved respirator, as conditions warrant. |
| Eye Protection: | Safety glasses |
| Protective Gloves: | Compatible chemical-resistant gloves |
| Other Protective Clothing: | Lab coat |

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| Engineering Controls (Ventilation etc.): | Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. |
| Work/Hygienic/Maintenance Practices: | Do not take internally. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Wash thoroughly after handling. |

9. Physical and Chemical Properties

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| Physical States: | <input type="checkbox"/> Gas <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Solid |
| Melting Point: | No data. |
| Boiling Point: | No data. |
| Autoignition Pt: | 455.00 C |
| Flash Pt: | -10.00 C Method Used: Closed Cup |
| Explosive Limits: | LEL: 3.1% at 25.0 C UEL: 16% at 25.0 C |
| Specific Gravity (Water = 1): | No data. |
| Vapor Pressure (vs. Air or mm Hg): | 173 MM_HG at 20.0 C |
| Vapor Density (vs. Air = 1): | No data. |
| Evaporation Rate: | No data. |
| Solubility in Water: | No data. |
| Percent Volatile: | No data. |
| Formula: | C ₁₆ H ₁₃ BrO ₂ |
| Molecular Weight: | 317.20 |
| Appearance and Odor: | No data available. |

10. Stability and Reactivity

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| Stability: | Unstable <input type="checkbox"/> Stable <input checked="" type="checkbox"/> |
| Conditions To Avoid - Instability: | heat, flames and sparks |
| Incompatibility - Materials To Avoid: | nitrates strong oxidizing agents |
| Hazardous Decomposition Or Byproducts: | carbon dioxide carbon monoxide |
| Possibility of Hazardous Reactions: | Will occur <input type="checkbox"/> Will not occur <input checked="" type="checkbox"/> |
| Conditions To Avoid - Hazardous Reactions: | No data available. |

11. Toxicological Information

The toxicological effects of this product have not been thoroughly studied.

Methyl Acetate - Toxicity Data: Oral LD50 (rat): > 5,000 mg/kg; Skin LD50 (rabbit): > 5,000 mg/kg; Irritation Data: Skin (rabbit): 500 mg (24h) mild; Eyes (rabbit): 100 mg (24h) moderate;

Chronic Toxicological Effects:

Only select Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information.
Methyl Acetate RTECS Number: AI9100000

| Hazardous Components (Chemical Name) | CAS # | NTP | IARC | ACGIH | OSHA |
|--------------------------------------|-------------|------|------|-------|------|
| 1. (S)-Bromo-enol lactone | 478288-94-7 | n.a. | n.a. | n.a. | n.a. |
| 2. Methyl acetate | 79-20-9 | n.a. | n.a. | n.a. | n.a. |

12. Ecological Information

Avoid release into the environment.
Runoff from fire control or dilution water may cause pollution.

13. Disposal Considerations

Waste Disposal Method: Dispose in accordance with local, state, and federal regulations.

14. Transport Information

LAND TRANSPORT (US DOT)

DOT Proper Shipping Name: Methyl Acetate Solution
DOT Hazard Class: 3
DOT Hazard Label: FLAMMABLE LIQUID
UN/NA Number: 1231
Packing Group: II

LAND TRANSPORT (European ADR/RID)

ADR/RID Shipping Name: Methyl Acetate Solution
UN Number: 1231
Hazard Class: 3 - FLAMMABLE LIQUID
Packing Group: II

AIR TRANSPORT (ICAO/IATA)

ICAO/IATA Shipping Name: Methyl Acetate Solution
UN Number: 1231
Hazard Class: 3 - FLAMMABLE LIQUID
Packing Group: II
IATA Classification: 3

Additional Transport Information: Transport in accordance with local, state, and federal regulations.

15. Regulatory Information

European Community Hazard Symbol codes: F: Highly Flammable; Xi: Irritant

European Community Risk and Safety Phrases

- R11 - Highly flammable.
- R36 - Irritating to eyes.
- R66 - Repeated exposure may cause skin dryness or cracking
- R67 - Vapours may cause drowsiness and dizziness
- S16 - Keep away from sources of ignition.
- S24/25 - Avoid contact with skin and eyes.
- S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S29 - Do not empty into drains.
- S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection.
- S33 - Take precautionary measures against static discharges.

US EPA SARA Title III

| Hazardous Components (Chemical Name) | CAS # | Sec.302 (EHS) | Sec.304 RQ | Sec.313 (TRI) | Sec.110 |
|--------------------------------------|-------------|---------------|------------|---------------|---------|
| 1. (S)-Bromo-enol lactone | 478288-94-7 | No | No | No | No |
| 2. Methyl acetate | 79-20-9 | No | No | No | No |

Other US EPA or State Lists

| Hazardous Components (Chemical Name) | CAS # | CAA HAP,ODC | CWA NPDES | TSCA | CA PROP.65 |
|--------------------------------------|-------------|-------------|-----------|------|------------|
| 1. (S)-Bromo-enol lactone | 478288-94-7 | No | No | No | No |



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|--------------------------------------|---------|-------------|-----------|--------------------|------------|
| 2. Methyl acetate | 79-20-9 | No | No | Inventory, 8A PAIR | No |

Regulatory Information Statement:

This SDS was prepared in accordance with Regulation (EC) No.1272/2008 and European Directive 67/548/EEC as amended.

16. Other Information

Company Policy or Disclaimer

For research use only, not for human or veterinary use.

DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

N.A.=Not available, N.P.=Not applicable, N.D.=Not determined, N.E.=Not established, N.R.=Not required