

## SAFETY DATA SHEET

Preparation Date: 09/10/2019

Revision date 09/10/2019

Revision Number: G1

### 1. IDENTIFICATION

#### Product identifier

**Product code:** B1934  
**Product Name:** BROMOCYCLOBUTANE, 98+%, REAGENT

#### Other means of identification

**Synonyms:** Cyclobutyl bromide  
 Cyclobutane, bromo-  
**CAS #:** 4399-47-7  
**RTECS #** Not available  
**CI#:** Not available

#### Recommended use of the chemical and restrictions on use

**Recommended use:** No information available.  
**Uses advised against** No information available

**Supplier:** Spectrum Chemical Mfg. Corp  
 14422 South San Pedro St.  
 Gardena, CA 90248  
 (310) 516-8000

**Order Online At:** <https://www.spectrumchemical.com>  
**Emergency telephone number** Chemtrec 1-800-424-9300  
**Contact Person:** Tom Tyner (USA - West Coast)  
**Contact Person:** Ibad Tirmiz (USA - East Coast)

### 2. HAZARDS IDENTIFICATION

#### Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Considered a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2
Specific target organ toxicity (single exposure)	Category 3
Flammable liquids	Category 2

#### Label elements

##### **Danger**

##### **Hazard statements**

Causes skin irritation  
 Causes serious eye irritation  
 May cause respiratory irritation

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Highly flammable liquid and vapor



**Hazards not otherwise classified (HNOC)**

Not Applicable

**Other hazards**

Not available

**Precautionary Statements - Prevention**

Wash face, hands and any exposed skin thoroughly after handling  
Wear protective gloves/protective clothing/eye protection/face protection  
Avoid breathing mist or vapors  
Use only outdoors or in a well-ventilated area  
Keep away from heat/sparks/open flames/hot surfaces. — No smoking  
Keep container tightly closed  
Ground container and receiving equipment  
Use explosion-proof equipment  
Use only non-sparking tools  
Take precautionary measures against static discharge  
Keep cool

**Precautionary Statements - Response**

In case of fire: Use CO<sub>2</sub>, dry chemical, or foam to extinguish.  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.  
If skin irritation occurs: Get medical attention  
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water  
Wash contaminated clothing before reuse  
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell.

**Precautionary Statements - Storage**

Store in a well-ventilated place. Keep container tightly closed  
Store locked up

**Precautionary Statements - Disposal**

Dispose of contents and container to an approved waste disposal plant in accordance with local, regional, national and international regulations as applicable

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Component	CAS No	Weight-%
Bromocyclobutane, 98+%, Reagent	4399-47-7	100

**4. FIRST AID MEASURES**

**First aid measures**

**General Advice:** National Capital Poison Center in the United States can provide assistance if you have a poison emergency and need to talk to a poison specialist. Call

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1-800-222-1222.

- Skin Contact:** Wash off immediately with soap and plenty of water removing all contaminated clothing and shoes. Get medical attention if irritation develops.
- Eye Contact:** Flush eyes with water for 15 minutes. Get medical attention. If symptoms persist, call a physician.
- Inhalation:** Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
- Ingestion:** Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician if necessary.

**Most important symptoms and effects, both acute and delayed**

- Symptoms**
- Causes skin irritation
  - Causes serious eye irritation
  - May cause coughing and shortness of breath
  - May cause respiratory irritation
  - Headache
  - Nausea
  - Vomiting
  - Dizziness
  - tiredness

**Indication of any immediate medical attention and special treatment needed**

**Notes to Physician:** Treat symptomatically.

**Protection of first-aiders**

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste.

**5. FIRE-FIGHTING MEASURES**

**Extinguishing Media**

**Suitable Extinguishing Media:** Carbon dioxide (CO<sub>2</sub>). Dry chemical. Alcohol-resistant foam. Water spray.

**Unsuitable Extinguishing Media:** Do not use a solid (straight) water stream as it may scatter and spread fire.

**Specific hazards arising from the chemical**

**Hazardous combustion products** Carbon Monoxide, Carbon Dioxide. Hydrogen bromide gas.

**Specific hazards** Flammable. May be ignited by heat, sparks or flames. Vapor may travel considerable distance to source of ignition and flash back. Vapors may form explosive mixtures with air. Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks). Container explosion may occur under fire conditions or when heated. Fire may produce irritating, corrosive and/or toxic gases.

**Special Protective Actions for Firefighters**

<b>Specific Methods:</b>	Water mist may be used to cool closed containers. For larger fires, use water spray or fog. Cool containers with flooding quantities of water until well after fire is out.
<b>Special Protective Equipment for Firefighters:</b>	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

**Personal Precautions:** Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Remove all sources of ignition. Pay attention to flashback. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use spark-proof tools and explosion-proof equipment. In case of large spill, water spray or vapor suppressing foam may be used to reduce vapors, but may not prevent ignition in closed spaces.

**Environmental precautions** Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Prevent entry into waterways, sewers, basements or confined areas.

### Methods and material for containment and cleaning up

**Methods for containment** Stop leak if you can do it without risk. Absorb spill with inert material (e.g. vermiculite, dry sand or earth). In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.

**Methods for cleaning up** Use appropriate tools to put the spilled material in a suitable chemical waste disposal container. Use only non-sparking tools. Clean contaminated surface thoroughly.

## 7. HANDLING AND STORAGE

### Precautions for safe handling

**Technical Measures/Precautions:**

Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from incompatible materials.

**Safe Handling Advice:**

Wear personal protective equipment. Use only in well-ventilated areas. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Do not breathe vapors or spray mist. Do not ingest. When using do not smoke. Handle in accordance with good industrial hygiene and safety practice.

### Conditions for safe storage, including any incompatibilities

**Technical Measures/Storage Conditions:**

Sensitive to light. Store in light-resistant containers. Moisture sensitive. Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Store at room temperature in the original container. Store in a segregated and approved area. Store away from incompatible materials.

**Incompatible Materials:**

Strong oxidizing agents  
Strong reducing agents  
Strong acids

Strong bases  
Alkalis

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Control parameters

#### National occupational exposure limits

##### United States

Component	CAS No	OSHA	NIOSH	ACGIH	AIHA WEEL
Bromocyclobutane, 98+%, Reagent	4399-47-7	None	None	None	None

##### Canada

Component	CAS No	Canada - Alberta	Canada - British Columbia	Canada - Ontario	Canada - Quebec
Bromocyclobutane, 98+%, Reagent	4399-47-7	None	None	None	None

##### Australia and Mexico

Component	CAS No	Australia	Mexico
Bromocyclobutane, 98+%, Reagent	4399-47-7	None	None

### Appropriate engineering controls

#### Engineering measures to reduce exposure:

Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

### Individual protection measures, such as personal protective equipment

#### Personal Protective Equipment

- Eye protection:** Goggles or Safety glasses with side-shields.
- Skin and body protection:** Chemical resistant apron  
Long sleeved clothing  
Gloves
- Respiratory protection:** Vapor respirator. Be sure to use an approved/certified respirator or equivalent.
- Hygiene measures:** Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical state:**  
Liquid

**Appearance:**  
Clear.

**Color:**  
Colorless to pale yellow.

**Odor:**  
No information available.

**Taste:**  
No information available.

**Formula:**  
C<sub>4</sub>H<sub>7</sub>Br

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<b>Molecular/Formula weight (g/mole):</b> 135.00	<b>Flammability (solid, gas)</b> no data available	<b>Flashpoint (°C/°F):</b> 22°C/ 71.6°F
<b>Flash Point Tested according to:</b> Closed cup	<b>Autoignition Temperature (°C/°F):</b> No information available	<b>Lower Explosion Limit (%):</b> No information available
<b>Upper Explosion Limit (%):</b> No information available	<b>Melting point/range(°C/°F):</b> No information available	<b>Decomposition temperature(°C/°F):</b> No information available
<b>Boiling point/range(°C/°F):</b> 108°C/ 226.4°F	<b>Bulk density:</b> No information available	<b>Density (g/cm3):</b> 1.43
<b>Specific gravity:</b> No information available	<b>pH</b> No information available	<b>Vapor pressure @ 20°C (kPa):</b> No information available
<b>Evaporation rate:</b> No information available	<b>Vapor density:</b> 4.7	<b>VOC content (g/L):</b> No information available
<b>Odor threshold (ppm):</b> No information available	<b>Partition coefficient (n-octanol/water):</b> No information available	<b>Viscosity:</b> No information available
<b>Miscibility:</b> No information available	<b>Solubility:</b> No information available	

## 10. STABILITY AND REACTIVITY

### Reactivity

No information available

### Chemical stability

**Stability:** Sensitive to light. Moisture Sensitive. Stable under recommended storage conditions.

**Possibility of Hazardous Reactions:** Hazardous polymerization does not occur

**Conditions to avoid:** Heat. Exposure to moisture. Exposure to light. Ignition sources. Incompatible materials.

**Incompatible Materials:**  
Strong oxidizing agents  
Strong reducing agents  
Strong acids  
Strong bases  
Alkalis

**Hazardous decomposition products:** Hydrogen Bromide.

### Other Information

**Corrosivity:** No information available

**Special Remarks on Corrosivity:** No information available

## 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

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**Principal Routes of Exposure:**

Skin. Eyes. Inhalation.

**Acute Toxicity****Component Information**

Bromocyclobutane, 98+%, Reagent	
CAS No	4399-47-7

**LD50/oral/rat** = No information available  
**LD50/oral/mouse** = No information available  
**LD50/dermal/rabbit** = No information available  
**LD50/dermal/rat** = No information available  
**LC50/inhalation/rat** = No information available  
**LC50/inhalation/mouse** = No information available  
**Other LD50 or LC50 information** = No information available

**Product Information**

**LD50/oral/rat** =  
**Value - Acute Toxicity** = No information available

**LD50/oral/mouse** =  
**Value - Acute Tox** = No information available

**LD50/dermal/rabbit**  
**Value - Acute Toxicity** = No information available

**LD50/dermal/rat**  
**VALUE - Acute Tox** = No information available

**LC50/inhalation/rat**  
**VALUE-Vapor** = No information available  
**VALUE-Gas** = No information available  
**VALUE-Dust/Mist** = No information available

**LC50/Inhalation/mouse**  
**VALUE-Vapor** = No information available  
**VALUE - Gas** = No information available  
**VALUE - Dust/Mist** = No information available

**Symptoms**

**Skin Contact:** Causes skin irritation.

**Eye Contact:** Causes serious eye irritation.

**Inhalation** May cause respiratory irritation. Exposure to high concentrations may cause headache, nausea, vomiting. Inhalation of vapors may cause drowsiness and dizziness.

**Ingestion** May cause digestive (gastrointestinal) tract irritation. May cause coughing. May affect respiration (shortness of breath).

**Aspiration hazard** No information available.

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## Delayed and immediate effects as well as chronic effects from short and long-term exposure

**Chronic Toxicity** No information available.

**Sensitization:** No information available.

**Mutagenic Effects:** No information available

**Carcinogenic effects:** Not considered carcinogenic.

Component	CAS No	IARC	ACGIH - Carcinogens	NTP	OSHA HCS - Carcinogens	Australia - Notifiable Carcinogenic Substances	Australia - Prohibited Carcinogenic Substances
Bromocyclobutane, 98+%, Reagent	4399-47-7	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

*ACGIH (American Conference of Governmental Industrial Hygienists)*

*IARC (International Agency for Research on Cancer)*

*NTP (National Toxicology Program)*

*OSHA (Occupational Safety and Health Administration of the US Department of Labor)*

**Reproductive toxicity** No data is available

**Reproductive Effects:** No information available

**Developmental Effects:** No information available

**Teratogenic Effects:** No information available

### **Specific Target Organ Toxicity**

**STOT - single exposure** respiratory system.

**STOT - repeated exposure** No information available.

**Target Organs:** No information available.

## **12. ECOLOGICAL INFORMATION**

### **Ecotoxicity**

**Ecotoxicity effects:** No data available.

**Persistence and degradability:** No information available

**Bioaccumulative potential:** No information available.

**Mobility in soil** No information available

**Other adverse effects** No information available.

## **13. DISPOSAL CONSIDERATIONS**

### **Disposal Methods**

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**Waste from residues / unused products:**

Waste must be disposed of in accordance with Federal, State and Local regulation.

**Contaminated packaging:**

Empty containers should be taken for local recycling, recovery or waste disposal

Component	CAS No	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Bromocyclobutane, 98+%, Reagent	4399-47-7	None	None	None	None

**14. TRANSPORT INFORMATION****DOT**

**UN-No:** UN1993  
**Proper Shipping Name:** Flammable liquids, n.o.s.  
**Hazard Class** 3  
**Subsidiary Class** No information available  
**Packing group:** II  
**Emergency Response Guide Number** 128  
**Marine Pollutant** No data available  
**DOT RQ (lbs):** No information available  
**Special Provisions** IB2, T7, TP1, TP8, TP28  
**Symbol(s):** No information available  
**Description:** UN1993, Flammable liquids, n.o.s. (Bromocyclobutane, 98+%, Reagent), 3, II

**TDG (Canada)**

**UN-No:** UN1993  
**Proper Shipping Name:** Flammable liquid, n.o.s.  
**Hazard Class** 3  
**Subsidiary Risk:** No information available  
**Packing Group:** II  
**Marine Pollutant** No Information available  
**Description:** UN1993, Flammable liquid, n.o.s. (Bromocyclobutane, 98+%, Reagent), 3, II

**ADR**

**UN Number** UN1993  
**Proper Shipping Name:** Flammable liquid, n.o.s.  
**Transport hazard class(es)** 3  
**Packing group** II  
**Subsidiary Risk:** No information available  
**Special Provisions** 274, 601, 640C  
**Description:** UN1993, Flammable liquid, n.o.s. (Bromocyclobutane, 98+%, Reagent), 3, II

**IMDG**

**UN-No:** UN1993  
**Proper Shipping Name:** Flammable liquids, n.o.s.  
**Hazard Class:** 3  
**Subsidiary Risk:** No information available  
**Packing Group:** II  
**Marine Pollutant** No information available  
**EMS:** F-E  
**Special Provisions** 274  
**Description** UN1993, Flammable liquid, n.o.s. (Bromocyclobutane, 98+%, Reagent), 3, II

**RID****Product code:** B1934
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**UN Number** UN1993  
**Proper Shipping Name:** Flammable liquid, n.o.s.  
**Transport hazard class(es)** 3  
**Subsidiary Risk:** No information available  
**Packing group** II  
**Special Provisions** 274, 601, 640D  
**Description:** UN1993, Flammable liquid, n.o.s. (Bromocyclobutane, 98+%, Reagent), 3, II

**ICAO (air)**

**UN-No:** UN1993  
**Proper Shipping Name:** Flammable liquid, n.o.s.  
**Hazard Class** 3  
**Subsidiary Risk:** No information available  
**Packing Group:** II  
**Description:** UN1993, Flammable liquid, n.o.s. (Bromocyclobutane, 98+%, Reagent), 3, II  
**Special Provisions** A3

**IATA**

**UN Number** UN1993  
**Proper Shipping Name:** Flammable liquid, n.o.s.  
**Transport hazard class(es)** 3  
**Subsidiary Risk:** No information available  
**Packing group** II  
**Precautionary Statements - Response** 3H  
**Special Provisions** No information available  
**Description:** UN1993, Flammable liquid, n.o.s. (Bromocyclobutane, 98+%, Reagent), 3, II

**15. REGULATORY INFORMATION**

**International Inventories**

Component	CAS No	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	China IECSC	Australia (AICS)	EINECS-No.
<i>Bromocyclobutane, 98+%, Reagent</i>	4399-47-7	Not Listed	Not present	Not present	Not present	Not listed	Not listed	Present 224-530-9

**U.S. Regulations**

**California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.**

**Chemicals Known to the State of California to Cause Cancer:**

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

**Chemicals Known to the State of California to Cause Reproductive Toxicity:**

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Component	CAS No	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Bromocyclobutane, 98+%, Reagent	4399-47-7	Not Listed	Not Listed	Not Listed	Not Listed

**CERCLA/SARA**

Component	CAS No	CERCLA - Hazardous Substances and their Reportable	Section 302 Extremely Hazardous Substances	Section 302 Extremely Hazardous Substances and	Section 313 - Chemical Category	Section 313 - Reporting de minimis

		Quantities	and TPQs	RQs		
Bromocyclobutane, 98+%, Reagent	4399-47-7	None	None	None	None	None

## U.S. TSCA

Component	CAS No	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Bromocyclobutane, 98+%, Reagent	4399-47-7	Not Applicable	Not Applicable

## Canada

### WHMIS 2015 - GHS Classifications

WHMIS 2015 Hazard Classification Information:

The WHMIS 2015 classification of this product has not been validated or reviewed yet.

**Canada Hazardous Products Regulation** This product has not been classified according to the hazard criteria of the HPR (Hazardous Products Regulation) and the SDS contains all of the information required by the HPR

## DSL/NDSL

Component	CAS No	Canada (DSL)	Canada (NDSL)
Bromocyclobutane, 98+%, Reagent	4399-47-7	Not Listed	Not Listed

Component	CAS No	CEPA Schedule I - Toxic Substances
Bromocyclobutane, 98+%, Reagent	4399-47-7	Not listed
Component	CAS No	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
Bromocyclobutane, 98+%, Reagent	4399-47-7	Not listed

## EU Classification

### EU GHS - SV - CLP 1272/2008

Component	CAS No	EU GHS - SV - CLP (1272/2008)
Bromocyclobutane, 98+%, Reagent	4399-47-7	

### EU - CLP (1272/2008)

### R-phrase(s)

R11 - Highly flammable

R36/37/38 - Irritating to eyes, respiratory system and skin

### S -phrase(s)

S 7 - Keep container tightly closed.

S36 - Wear suitable protective clothing

S38 - In case of insufficient ventilation, wear suitable respiratory equipment

S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)

Component	CAS No	Classification	Concentration Limits:	Safety Phrases
Bromocyclobutane,	4399-47-7		No information	

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The product is classified in accordance with Annex VI to Directive 67/548/EEC

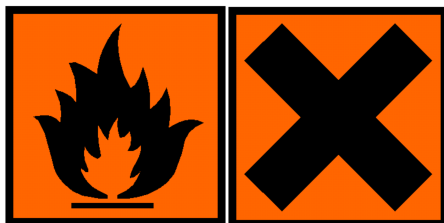
**Indication of danger:**

F - Highly flammable

Xi - Irritant

**F**

**Xi**



**16. OTHER INFORMATION**

<b>Preparation Date:</b>	09/10/2019
<b>Revision date</b>	09/10/2019
<b>Prepared by:</b>	Sonia Owen

**Disclaimer:**

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

**End of Safety Data Sheet**