# Material Safety Data Sheet

## 1. Product and Company Identification

Product name : **1,3-Butadiene**

Chemical formula : C4H6

Synonyms : Biethylene; Bivinyl; Pyrrolylene; Vinylethylene; Divinyl; Buta-1,3-diene; Alpha-gamma-butadiene; Erythrene; Methylallene; Butadiene; UN 1010

Company : Med-Tech Gases, Inc.
20 Hall Street
Medford, MA 02155

Telephone : 800-FINE-GAS

Emergency : 800-424-9300

## 2. Composition/Information on Ingredients

| Components | CAS Number | % Volume |
|---|---|---|
| 1,3-Butadiene | 106-99-0 | 99+% |
| (1,1-Dimethylethyl)1,2-Benzenediol | 27213-78-1 | 0.1 – 0.2% |

## 3. Hazards Identification

Emergency Overview

Flammable gas. May cause flash fire. May polymerize. Containers may rupture or explode.
May form peroxides during prolonged storage.
May cause central nervous system depression, cancer hazard (in humans).

Potential Health Effects

Inhalation : Irritation, nausea, headache, drowsiness, dizziness, loss of coordination. May cause digestive disorders, kidney damage, liver enlargement, reproductive effects, cancer in long term exposure.

Eye contact : Irritation, blurred vision.

Skin contact : Blisters, frostbite.

Ingestion : Frostbite.

Chronic Health Hazard : Not applicable.

## 4. First Aid Measures

General advice : None.

Eye contact : Wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of chemical remains. Get medical attention immediately.

Skin contact : If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115°F; 41-46°C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blanket. Get immediate medical

attention.

| | | |
|---|---|---|
| Ingestion | : | If a large amount is swallowed, get medical attention. |
| Inhalation | : | If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention. |
| Note to physicians | : | For inhalation, consider oxygen. |

## 5. Fire-Fighting Measures

| | | |
|---|---|---|
| Suitable extinguishing media | : | Carbon dioxide, regular dry chemical.<br>Large fires: Use regular foam or flood with fine water spray. |
| Specific hazards | : | Severe fire hazard. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. |
| Fire fighting | : | Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible, then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Stop leak if possible without personal risk. Let fire burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables. Evacuation radius: 800 meters (1/2 mile). Stop flow of gas. |

## 6. Accidental Release Measures

| | | |
|---|---|---|
| Water release | : | Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers. |
| Occupational spill/release | : | Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away. Isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA). |
| Additional advice | : | None. |

## 7. Handling and Storage

Handling

Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders. Use spark-proof tool and explosion-proof equipment.

Storage

Store in accordance with all current regulations and standards. Grounding and bonding required. Store outside or in a detached building. Secure to prevent tipping. Store in a cool, dry place. store in a well-ventilated area. Avoid heat, flames, sparks and other sources of ignition. Subject to storage regulation: U.S. OSHA 29 CFR 1910.101. See original container for storage recommendations. Keep separated from incompatible substances.

## 8. Exposure Controls / Personal Protection

Exposure limits

| | | |
|---|---|---|
| ACGIH | : | 2 ppm TWA |

| | | |
|---|---|---|
| OSHA (final) | : | 5 ppm STEL (see 29 CFR 1910.1051)<br>1 ppm TWA |
| OSHA (vacated) | : | 1000 ppm TWA; 2200 mg/m3 TWA |

IDLH

2000 ppm

Engineering measures/Ventilation

Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal protective equipment

| | | |
|---|---|---|
| Respiratory protection | : | The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.<br>OSHA standard: Respirator selection should comply with 29 CFR 1910.134 and 29 CFR 1910.1051.<br>NIOSH recommendations: At any detectable concentration – Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.<br>Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.<br>Escape – Any air-purifying full-face respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.<br>Any appropriate escape-type, self-contained breathing apparatus.<br>For unknown concentrations or immediately dangerous to life or health – Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.<br>Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. |
| Hand protection | : | Wear insulated gloves. |
| Eye protection | : | For the gas: Eye protection is not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area. |
| Skin and body protection | : | For the gas, Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing. |

## 9. Physical and Chemical Properties

| | | |
|---|---|---|
| Form | : | Gas. |
| Color | : | Colorless. |
| Odor | : | Distinct odor. |
| Molecular weight | : | 54.09 |
| Vapor pressure | : | 910 mmHg @ 20°C |
| Vapor density | : | 1.87 (air = 1) |
| Specific gravity | : | 0.6211 @ 20°C |
| Boiling point | : | -5°C |
| Melting point | : | -109°C |
| Water solubility | : | 0.05% @ 20°C |
| Solvent solubility | : | Soluble: organic solvents, ether, acetone, benzene, ethanol, cyclohexane, |

methanol, carbon tetrachloride, chloroform

## 10. Stability and Reactivity

| | | |
|---|---|---|
| Stability | : | May polymerize. Avoid contact with light or storage and use above room temperature. May explode if exposed to shock, friction, or heating. |
| Conditions to avoid | : | Avoid heat, flames, sparks or other sources of ignition. Containers may rupture or explode if exposed to heat. |
| Materials to avoid | : | Metal carbide, metal salts, combustible materials, metals, oxidizing materials, halogens, metal oxides. |
| Hazardous decomposition products | : | Thermal decomposition products: oxides of carbon. |
| Possibility of hazardous reactions | : | May polymerize. Avoid contact with heat, air, light initiators or curing agents. May polymerize with evolution of heat. Closed containers may rupture violently. |

## 11. Toxicological Information

The components of this material have been reviewed in various sources and the following endpoints are published:

| | | |
|---|---|---|
| 1,3-BUTADIENE (106-99-0) | : | Inhalation LC50 Rat: 285 mg/L/4H; Oral LD50 Rat: 5480 mg/kg |

Acute Toxicity Level

| | | |
|---|---|---|
| 1,3-BUTADIENE (106-99-0) | : | Slightly toxic: Ingestion<br>Non toxic: Inhalation |

Component Carcinogenicity

| | | |
|---|---|---|
| ACGIH | : | A2 – Suspected Human Carcinogen. |
| IARC | : | Monograph 97 [2008]; Monograph 71 [1999] (Group 1 (carcinogenic to humans)) |
| DFG | : | Category 1 (causes cancer in man)<br>Present<br>Known Human Carcinogen |

Target Organs

| | | |
|---|---|---|
| 1,3-BUTADIENE (106-99-0) | : | Central nervous system |

Additional Data

Alcohol may enhance the toxic effects.

## 12. Ecological Information

Aquatic Toxicity

| | | |
|---|---|---|
| 1,3-BUTADIENE (106-99-0) | : | Fish: 24 Hr LC50 Lagodon rhomboides: 71.5 mg/L<br>Invertebrate: 96 Hr EC50 Daphnia magna: 24.8 mg/L |

## 13. Disposal Considerations

| | | |
|---|---|---|
| Waste from residues / unused products | : | Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. D003. Dispose in accordance with all applicable regulations. |
| Contaminated packaging | : | Return cylinder to supplier. |

## 14. Transport Information

DOT (US only)

| | | |
|---|---|---|
| Proper shipping name | : | Butadienes, stabilized |
| Class | : | 2.1 |
| UN/ID No. | : | UN1010 |
| Labeling | : | Flammable Gas. |

## 15. Regulatory Information

U.S. Federal Regulations

This material contains one or more of the following chemicals required under SARA Section 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

| | | |
|---|---|---|
| 1,3-BUTADIENE (106-99-0) | : | 10 lb final RQ; 4.54 kg final RQ<br>SARA 313: 0.1% de minimis concentration<br>CERCLA: 10 lb final RQ; 4.54 kg final RQ |

SARA 311/312

Acute: Yes
Chronic: Yes
Fire: Yes
Reactive: Yes
Pressure: Yes

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

| Component | CAS | CA | MA | MN | NJ | PA | RI |
|---|---|---|---|---|---|---|---|
| 1,3-BUTADIENE | 106-99-0 | Yes | Yes | Yes | Yes | Yes | Yes |

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.