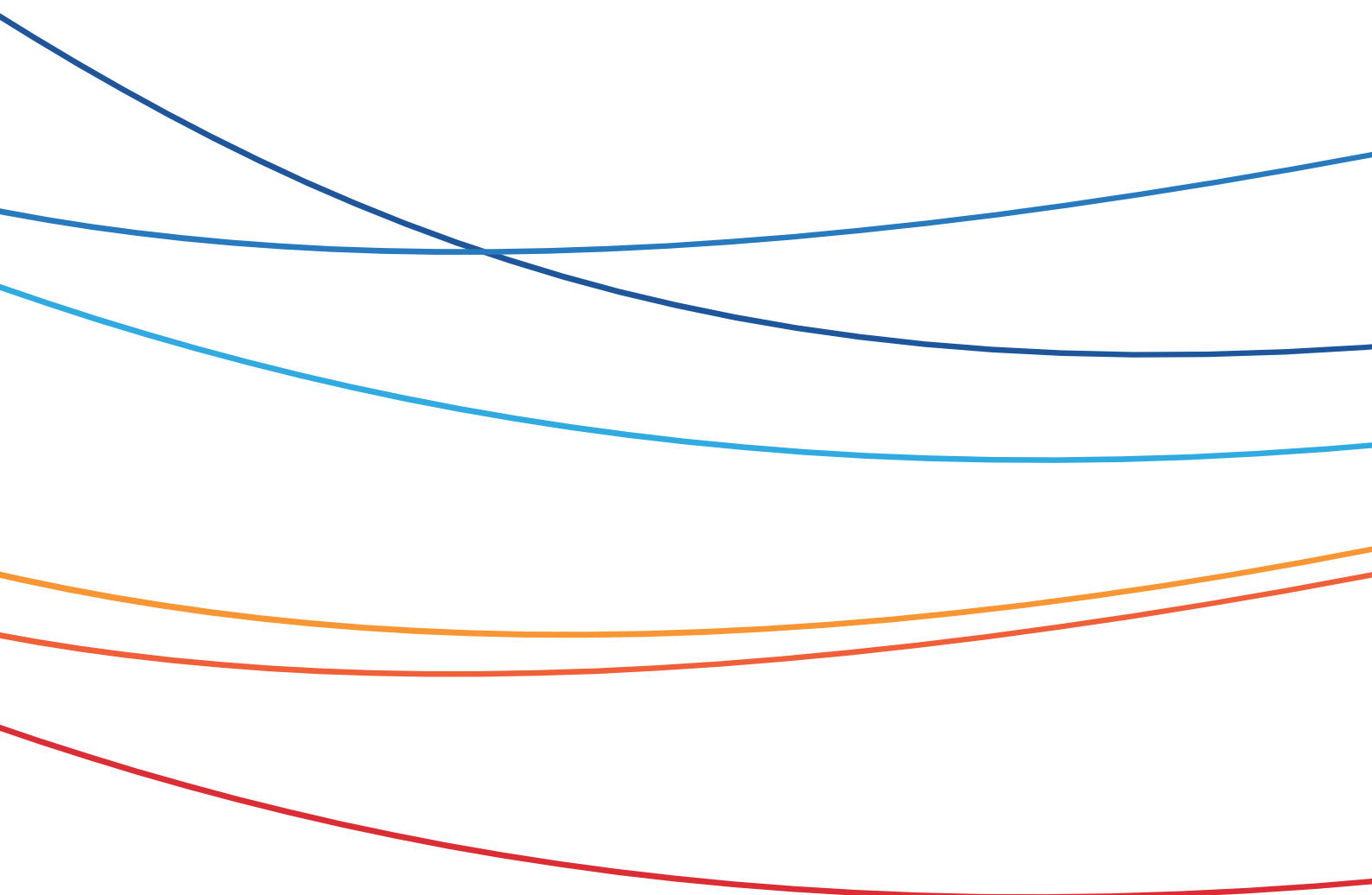


Butadiene MSDS



MATERIAL SAFETY DATA SHEET

1.0 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: BUTADIENE

MANUFACTURER/SUPPLIER:

EMERGENCY HEALTH INFORMATION:

EMERGENCY SPILL INFORMATION:

**OTHER PRODUCT SAFETY
INFORMATION:**

2.0 COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS#	Range % by Wt.
1,3-Butadiene	106-99-0	100

(See Section 8.0, "Exposure Controls/Personal Protection", for exposure guidelines)

3.0 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Danger! Extremely flammable. Extremely cold material; can cause burns similar to frostbite. Vapors or fumes may form at elevated temperatures that may be irritating to the eyes. Cancer hazard. Vapor: Causes respiratory irritation. Inhalation causes headaches, dizziness, drowsiness, nausea, and respiratory irritation.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: Extremely cold material; can cause burns similar to frostbite. Vapors or fumes may form at elevated temperatures that may be irritating to the eyes.

SKIN CONTACT: Liquid can cause burns similar to frostbite.



INHALATION: Cancer hazard. Vapor: Causes respiratory irritation. Inhalation causes headaches, dizziness, drowsiness, nausea, and respiratory irritation. See "Toxicological Information" section (Section 11.0).

INGESTION: None expected under normal conditions of use.

HMIS CODE: (Health:2) (Flammability:4) (Reactivity:0)

NFPA CODE: (Health:2) (Flammability:4) (Reactivity:0)

4.0 FIRST AID MEASURES

EYE: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

SKIN: Flush exposed skin with plenty of water. Remove contaminated clothing, including shoes, and thoroughly clean and dry before reuse. Get medical attention if irritation develops.

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

INGESTION: None required.

5.0 FIRE FIGHTING MEASURES

FLASHPOINT: -105°F(-76°C)

UEL: 12.0%

LEL: 2.0%

AUTOIGNITION TEMPERATURE: 804°F (429°C)

FLAMMABILITY CLASSIFICATION: Extremely Flammable Liquid.

EXTINGUISHING MEDIA: Agents approved for Class B hazards (e.g., dry chemical, carbon dioxide, foam, steam) or water fog.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Extremely flammable liquid. Vapor may explode if ignited in enclosed area.

FIRE-FIGHTING EQUIPMENT: Firefighters should wear full bunker gear, including a positive pressure self-contained breathing apparatus.

PRECAUTIONS: Keep away from sources of ignition (e.g., heat and open flames). Keep container closed. Do not vent into atmosphere or enclosure unless area is sufficiently ventilated to reduce vapor concentrations below flammable limit.

HAZARDOUS COMBUSTION PRODUCTS: Hazardous polymerization possible with catalyst

and heat. Incomplete burning can produce carbon monoxide and/or carbon dioxide and other harmful products.

6.0 ACCIDENTAL RELEASE MEASURES

Remove or shut off all sources of ignition. Keep out of sewers and waterways. Wear respirator and spray with water to disperse vapors.

7.0 HANDLING AND STORAGE

HANDLING: Keep container closed. Use with adequate ventilation. Do not cut, puncture, or weld on or near this container.

STORAGE: Store in flammable liquids storage area. Store away from heat, ignition sources, and open flame in accordance with applicable regulations. Keep container closed.

8.0 EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE: Do not get in eyes. Wear chemical goggles.

SKIN: Do not get on skin or clothing. Wear clothing, gloves and footwear that cannot be penetrated by chemicals or oil.

INHALATION: Avoid breathing vapor. Use with adequate ventilation. If ventilation is inadequate, use supplied- air respirator approved by NIOSH.

ENGINEERING CONTROLS: Control airborne concentrations below the exposure guidelines.

EXPOSURE GUIDELINES:

Component	CAS#	Exposure Limits
1,3-Butadiene	106-99-0	OSHA PEL: 1 ppm (1996) ACGIH TLV-TWA: 2 ppm

9.0 CHEMICAL AND PHYSICAL PROPERTIES

APPEARANCE AND ODOR: Gas. Colorless.

pH: Not determined.

VAPOR PRESSURE: 1810 mm Hg at 15 °C

VAPOR DENSITY: 1.9

BOILING POINT: 23°F(-4.4°C)

MELTING POINT: -228°F(-144°C)

SOLUBILITY IN WATER: Negligible, below 0.1%.

SPECIFIC GRAVITY (WATER=1): 1.88 (gas) 0.62(liquid)

10.0 STABILITY AND REACTIVITY

STABILITY: Burning can be started easily.

CONDITIONS TO AVOID: Keep away from ignition sources (e.g. heat, sparks, and open flames).

MATERIALS TO AVOID: Avoid chlorine, fluorine, and other strong oxidizers.

HAZARDOUS DECOMPOSITION: None identified.

HAZARDOUS POLYMERIZATION: Hazardous polymerization possible with catalyst and heat.

11.0 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY DATA:

EYE IRRITATION: Testing not conducted. See Other Toxicity Data.

SKIN IRRITATION: Testing not conducted. See Other Toxicity Data.

DERMAL LD50: Testing not conducted. See Other Toxicity Data.

ORAL LD50: greater than 5480 mg/kg (rat).

INHALATION LC50: Testing not conducted. See Other Toxicity Data.

OTHER TOXICITY DATA: 1,3-Butadiene - 1,3-Butadiene has anesthetic action and at a very high concentrations causes CNS depression. Humans exposed to 1000 ppm showed no irritant effects. Human volunteers were exposed to 2000, 4000, or 8000 ppm for 6-8 hours. Concentrations of 2000-4000 ppm resulted in mild irritation of the eyes and difficulty in focusing. Mild irritation of the eyes and upper respiratory tract was noted following exposure to 8000 ppm for 8 hours. Exposure to 10,000 ppm for 5 minutes produce slight irritation and dryness of the nose and mouth and some increase in pulse rate but no effect on blood pressure or respiration. Signs and symptoms of overexposure are blurred vision, nausea, prickling and dryness of the mouth, throat, and nose, followed by fatigue, headache, vertigo, nausea, decreased blood pressure and pulse rate, unconsciousness, and respiratory paralysis. Aspiration of this product into the lungs can cause chemical pneumonitis and can be fatal.

The acute and subchronic toxicity of 1,3-butadiene is of low order. In lifetime (chronic) inhalation studies in rats, 1,3-butadiene was a weak carcinogen at 1000 ppm and 8000 ppm, whereas it produced a strong carcinogenic response in a lifetime inhalation study in mice following exposures

as low as 6.25 ppm. Different tumor sites were observed in mice (lung, mammary gland, forestomach, ovary, bone marrow, heart and lymphatic system) than in rats (pancreas, uterus, thyroid, mammary gland, testes, and Zymbal gland). Mice are believed to be more sensitive than rats to 1,3-butadiene because mice exhibit a higher degree of metabolism to DNA-reactive metabolites, butadiene monoepoxide and butadiene diepoxide, thought to be involved in butadiene carcinogenicity.

Past research has indicated that humans are more like rats regarding the formation of butadiene epoxides in that they do not produce sufficient levels of butadiene epoxides to result in DNA damage necessary for tumorigenesis. However, results of an epidemiology study (1995) in the styrene-butadiene rubber industry show that exposure to 1,3-butadiene, either alone or in combination with styrene exposure, is associated with an increased incidence of leukemia in certain segments of the workforce. The study found no increases in any other non-cancer or cancer cause of death, including other lymphopietic cancers that have been said to be caused by 1,3-butadiene. It is important that exposures in the workplace air be kept to levels at or below the recommended TLV.

The International Agency for Research on Cancer (IARC) has classified 1,3-butadiene in group 2A, "probably carcinogenic to humans". This determination was made prior to the completion of the 1995 epidemiology study.

12.0 ECOLOGICAL INFORMATION

Ecological testing has not been conducted on this product.

13.0 DISPOSAL INFORMATION

Disposal must be in accordance with applicable federal, state, or local regulations. Incineration at an EPA-permitted hazardous waste management facility as required by law.

14.0 TRANSPORTATION INFORMATION

U.S. DEPT OF TRANSPORTATION

Shipping Name	Butadiene, Inhibited
Hazard Class	2.1
Identification Number	UN1010 RQ (1,3 Butadiene)

INTERNATIONAL INFORMATION:

Sea (IMO/IMDG)

Shipping Name	Butadienes, Inhibited
Class	2.1
UN Number	UN1010 RQ (1,3 Butadiene)

Air (ICAO/IATA)



Shipping Name FORBIDDEN

European Road/Rail (ADR/RID)

Shipping Name Not determined.

Canadian Transportation of Dangerous Goods

Shipping Name Butadienes, Inhibited

Hazard Class 2.1

UN Number UN1010 RQ (1,3 Butadiene)

15.0 REGULATORY INFORMATION

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR Part 302.4): This product is reportable under 40 CFR Part 302.4 because it contains the following substance(s):

Component/CAS Number	Weight %	Component Reportable Quantity (RQ)
1,3-Butadiene 106-99-0	100	10 lbs.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR Part 355): This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA TITLE III SECTIONS 311/312 HAZARDOUS CATEGORIZATION (40 CFR Part 370): This product is defined as hazardous by OSHA under 29 CFR Part 1910.1200(d).

SARA TITLE III SECTION 313 (40 CFR Part 372): This product contains the following substance(s), which is on the Toxic Chemicals List in 40 CFR Part 372:

Component/CAS Number	Weight Percent
1,3-Butadiene 106-99-0	100

U.S. INVENTORY (TSCA): Listed on inventory.

OSHA HAZARD COMMUNICATION STANDARD: Flammable gas. Carcinogen.

EC INVENTORY (EINECS/ELINCS): Not determined.

JAPAN INVENTORY (MITI): Not determined.

AUSTRALIA INVENTORY (AICS): Not determined.

KOREA INVENTORY (ECL): Not determined.

PHILIPPINE INVENTORY (PICCS): Not determined.

16.0 OTHER INFORMATION

BIODEGRADABLE: YES

Prepared by:

Environment, Health and Safety Department

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This Material Safety Data Sheet conforms to the requirements of ANSI Z400.1.

This material safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we received from sources outside our company. We believe that information to be correct but cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either express or implied.

