



Material Safety Data

Product Name :BUTADIENE

긴급전화번호 (Emerhency Telephone Number)
061 - 688 - 6117 (24 hours)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1. Product

- Name : BUTADIENE
- UN Number : 1010

2. Advisable use and Restriction

- Advisable use : Synthetic rubber (SBR, NBR, etc.), ABS resin, Nylon 66, Latex paint, resin organic synthetic raw material, etc.
- Restriction : Do not handle until all safety precautions have been read and understood.

3. Manufacturer information

- Manufacture company : YEOCHUN NCC
- Address: 2 Yeosusandan-3ro(205-6,Pyeonggye-dong), Yeosu, Jeollanam-Do, Korea (555-210)
- Telephone: 82-61-688-6117

2. HAZARD IDENTIFICATION

1. Hazard classification

- FLAMMABLE GASES Category 1
- GASES UNDER PRESSURE Liqueied gas
- CARCINOGENICITY Category 1A
- GERM CELL MUTAGENICITY Category 1B

2. Allocation label elements

- Symbol



- Signal Word : Danger
- Hazard statements

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.

H340 May cause genetic defects.

H350 May cause cancer.

○ Precautionary statements

– Prevention

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

– Response

P308 + P313 IF exposed or concerned: Get medical advice/attention.

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 Eliminate all ignition sources if safe to do so.

– Storage

P403 Store in a well-ventilated place.

P405 Store locked up.

P410 + P403 Protect from sunlight. Store in a well-ventilated place.

– Disposal

P501 Dispose of contents/container to (in accordance with local/ regional/ national/ international regulation)

3. Other hazard information not included in hazard classification (NFPA)

Chemical Name	NFPA Level		
	Health	Flammability	Reactivity
1,3 BUTADIENE	2	4	2

3. INGREDIENT INFORMATION

Components	Common name	CAS No.	PCT(M%)
1,3 BUTADIENE	1,3-BUTADIENE	106-99-0	99.5 ~ 100

4. FIRST AID MEASURES

1. Following eye contact

- It is unlikely that emergency treatment will be required for contact with the gas form.
- If contact with liquefied or compressed gas occurs, flush eyes with large amounts of water for at least 15–20 minutes until no evidence of chemical remains.
- Get medical attention immediately.

2. Following skin contact

- It is unlikely that emergency treatment will be required for contact with the gas form.

- If contact with liquefied or compressed gas occurs, flush skin with large amounts of water for at least 15–20 minutes until no evidence of chemical remains.
- Get medical aid immediately.
- Wash skin with soap and water.
- If frostbite or cryogenic burns occur, warm affected area in warm water at a temperature of 107°F (41.7°C).
- Seek immediate medical assistance.

3. Following inhalation

- Administer oxygen if breathing is difficult.
- Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
- Give artificial respiration if victim is not breathing.
- Keep victim warm and quiet.
- Move to fresh air.
- Seek immediate medical assistance.

4. Following ingestion

- It is unlikely that emergency treatment will be required for contact with the gas form..
- It is unlikely that emergency treatment will be required.

5. Advice to physician

- Do not apply drugs of the adrenaline ephedrine group.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Exposures require specialized first aid with contact and medical follow-up .

5. FIRE FIGHTING MEASURES

1. Suitable/Unsuitable extinguishing media

- ☐ Suitable extinguishing media
 - CO2.
 - Dry chemical.
 - Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.
 - Use dry sand or earth to smother fire.
 - Water spray.
- ☐ Unsuitable extinguishing media
 - Direct water.

2. Specific hazards arising from the chemical

- ☐ Pyrolytic product
 - Can decompose at high temperatures forming toxic gases.
- ☐ Risk of fire and explosion
 - Containers may explode when heated.
 - Contains gas under pressure; may explode if heated.
 - Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
 - Extremely flammable gas.
 - Extremely flammable.

- Fire may produce irritating and/or toxic gases.
- May ignited from heat, friction or contamination.
- May violently polymerize and result in fire and explosion.
- Some may burn but none ignite readily.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.
- Will be easily ignited by heat, sparks or flames.
- Will form explosive mixtures with air.

3. Special protective equipment for firefighters

- Contact may cause burns to skin and eyes.
- DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.
- Damaged cylinders should be handled only by specialists.
- Evacuate area and fight fire from a safe distance.
- Fire involving Tanks: ALWAYS stay away from tanks engulfed in fire.
- Fire involving Tanks: Cool containers with flooding quantities of water until well after fire is out.
- Fire involving Tanks: Do not direct water at source of leak or safety devices; icing may occur.
- Fire involving Tanks: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Fire involving Tanks: For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
- Fire involving Tanks: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Move containers from fire area if you can do it without risk.
- Rescuers should put on appropriate protective gear.
- Runoff may cause pollution.
- Ruptured cylinders may rocket.
- Substance may be transported hot.
- Use extinguishing agent suitable for type of surrounding fire.
- Vapors from liquefied gas are initially heavier than air and spread along ground.

6. ACCIDENTAL RELEASE MEASURES

1. Health considerations and protective equipment

- All equipment used when handling the product must be grounded.
- Allow substance to evaporate.
- Do not direct water at source of leak.
- Do not enter areas which have more than 23.5% oxygen in the atmosphere, without respirator or air supplied mask.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Do not touch or walk through spilled material.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Isolate area until gas has dispersed.
- Isolate hazard area.
- Keep unnecessary and unprotected personnel from entering.
- Please note that materials and conditions to be avoided.
- Stop leak if you can do it without risk.

- The very fine particles can cause a fire or explosion, eliminate all ignition sources.
 - Ventilate the contaminated area.
2. Environmental precautions
- Prevent entry into waterways, sewers, basements or confined areas.
3. For cleaning up
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
 - Dike and collect water used to fight fire.
 - Small Spill: Flush area with flooding quantities of water.

7. HANDLING AND STORAGE

1. Precautions for safe handling
- Caution: Dangerous fire hazard when exposed to heat, or flame, sparks.
 - Use adequate machine for prevention when package handling.
 - Wear an appropriate Personal protection. (See Exposure Controls/Personal Protection section.)
2. Conditions for safe storage (including any incompatibilities)
- Choose a place that can be protected from strong oxidizers and acid.
 - Store containers: AVOID the place where can be damage and contamination.
 - Store in a cool/low-temperature, well-ventilated {dry} place {away from heat and ignition sources}

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1. Exposure exposure limits, Biological exposure standard :

Components	Occupational exposure	ACGIH	Biological standard
1,3 BUTADIENE	TWA : 2ppm STEL : 10ppm	TWA 2 ppm	No data available

2. Appropriate engineering controls
- Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
 - Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
3. Personal protection equipment
- ☐ Respiratory protection
- If high frequency of use or exposure, wear air respirator.
- ☐ Eye protection
- Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
 - Provide emergency showers and eyewash.
 - Wear suitable protective goggles and face shields.
- ☐ Hand protection
- Wear Non-moisture permeable chemical resistance protective gloves(latex, nitrile rubber, PC) for prevent skin contact.
 - Wear insulated gloves.
 - Wear suitable protective gloves.

- Body protection
- Wear suitable protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Gas
Odour	Mild aromatic
Odour threshold	4 mg/m ³
pH Values	non-base
Melting point/freezing point	–109 °C
Initial boiling point and boiling range	–4.4 °C
Flash point	–76 °C
Evaporation rate	N/A
Flammability(solid, gas)	Flammable gas
Upper/lower flammability or explosive limits	1.1~16.3 Vol %
Vapour pressure	2.55 x 10 ² kPa(20°C)
Solubility(ies)	7.35 x 10 ^{–2} g/100ml (0.735 g/l(25°C), Water)
Vapor Densities	1.87 (Air =1)
Relative density	0.6 (Water=1)
n-octanol/water partition coefficient	1.99 (Log Kow)
Auto ignition temperature	414°C
Decomposition temperature	–2541.5 K(kJ/mol)
Viscosity	7.54 x 10 ^{–3} cP(Liquid, – 40°C)
Molecular weight(mass)	54.09

10. STABILITY AND REACTIVITY

1. Stability and hazardous reactivity

- Can decompose at high temperatures forming toxic gases.
- Containers may explode when heated.
- Contains gas under pressure; may explode if heated.
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
- Extremely flammable gas.
- Extremely flammable.
- Fire may produce irritating and/or toxic gases.
- Fire may produce irritating, corrosive and/or toxic gases.
- May cause toxic effects if inhaled.
- May violently polymerize and result in fire and explosion.
- Will form explosive mixtures with air.
- Will be easily ignited by heat, sparks or flames.

- Stable under normal temperatures and pressures.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.
- 2. Conditions to avoid
 - Ignition source(heat, spark, flame, etc.).
- 3. Materials to avoid
 - Combustibles, reducing material.
 - Irritating and/or toxic gas.
- 4. Hazardous decomposition products
 - Corrosive/toxic fume.
 - Irritating, corrosive and/or toxic gas.

11. TOXICOLOGICAL INFORMATION

1. Exposure route information
 - ☐ Dermal, Inhalation exposure is possible since GAS
2. Health hazard information
 - ※ No data of the product. thus data was described by the product component.
 - ☐ Acute toxicity
 - Oral PRODUCT : N/A
 - 1,3 BUTADIENE : N/A / LD50 5480 mg/kg Rat
 - Dermal PRODUCT : No data
 - 1,3 BUTADIENE : No data
 - Inhalation-Gases PRODUCT : N/A
 - 1,3 BUTADIENE : N/A / LC50 285 mg/L/4h Rat
 - Inhalation-Vapours PRODUCT : N/A
 - 1,3 BUTADIENE : N/A
 - Inhalation-Dust/mist PRODUCT : N/A
 - 1,3 BUTADIENE : N/A
 - ☐ SKIN CORROSION/IRRITATION PRODUCT : No data
 - 1,3 BUTADIENE : No data
 - ☐ SERIOUS EYE DAMAGE/EYE IRRITATION PRODUCT : N/A
 - 1,3 BUTADIENE : N/A / Not irritating Rabbit
 - ☐ RESPIRATORY SENSITIZATION PRODUCT : No data
 - 1,3 BUTADIENE : No data
 - ☐ SKIN SENSITIZATION PRODUCT : No data
 - 1,3 BUTADIENE : No data
 - ☐ CARCINOGENICITY PRODUCT : Category 1A
 - 1,3 BUTADIENE : Category 1A / 1A
 - OSHA : No data
 - Notice of Employment and Labor : No data
 - NTP : K
 - IARC : 2A

- EU CLP : 1A
- ACGIH : A2
- GERM CELL MUTAGENICITY PRODUCT : Category 1B
 - 1,3 BUTADIENE : Category 1B / Positive Mouse
- REPRODUCTIVE TOXICITY PRODUCT : N/A
 - 1,3 BUTADIENE : N/A / There were no effects on gonadal function, mating behavior, conception, gestation, parturition, lactation of the F0 generation, and the development of F1 offspring. Rat
- SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE PRODUCT : N/A
 - 1,3 BUTADIENE : N/A / Human signs and symptoms from overexposure to 1,3-butadiene... include blurred vision, nausea, and irritating of the respiratory tract, progressing to a feeling of fatigue, headache, vertigo, nausea, decr blood pressure and pulse rate, unconsciousness, respiratory paralysis, and death. Human
- SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE PRODUCT : N/A
 - 1,3 BUTADIENE : N/A / Severe generalized toxicity due to malignant tumours occurred at all dose levels. Mouse
- ASPIRATION HAZARD PRODUCT : No data
 - 1,3 BUTADIENE : No data

12. ECOLOGICAL INFORMATION

1. Aquatic toxicity PRODUCT
 - ACUTE AQUATIC HAZARD : Not classified, LONG-TERM AQUATIC HAZARD : Not classified
 - Fish
 - 1,3 BUTADIENE : LC50 45 mg/L/96h Fish(Pimephales promelas)
 - Crustacea
 - 1,3 BUTADIENE : EC50 33 mg/L/48h Aquatic invertebrates(Daphnia magna)
 - Aquatic algae
 - 1,3 BUTADIENE : EC50 33 mg/L/72h Aquatic algae(Algae)
2. Persistence and degradation
 - Degradation
 - 1,3 BUTADIENE : No data
 - n-octanol water partition coefficient
 - 1,3 BUTADIENE : 1.99 log Kow
3. Bioaccumulative potential
 - Bioaccumulation
 - 1,3 BUTADIENE : No data
 - Biodegradation
 - 1,3 BUTADIENE : No data
4. Mobility in soil
 - Soil adsorption coefficient(Koc)
 - 1,3 BUTADIENE : No data

5. Other adverse effects

- Others
 - 1,3 BUTADIENE : No data
- Hazardous to ozone layer
 - 1,3 BUTADIENE : N/A

13. DISPOSAL CONSIDERATIONS

1. Disposal methods

- Dispose of container and unused contents in accordance with all applicable regulations.

2. Precautions (including disposal of contaminated container or package)

- Empty containers may explode and residues can be ignited when pressured, cut, weld, heated.
- Empty containers may rupture when pressured.
- Empty containers recycled under environmental laws.
- Wear an appropriate Personal protection. (See Exposure Controls/Personal Protection section.)

14. TRANSPORT INFORMATION

1. UN No : 1010

2. Proper shipping name : BUTADIENES, STABILIZED or BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED, containing more than 40% butadienes

3. Class or division : 2.1

4. Packing group : Not established

5. Marine pollutant : Not established

6. Special safety response for transportation or transportation measure :

- ☐ Emergency measures in case of fire : F-D
- ☐ Emergency measures in the effluent : S-U

15. REGULATORY INFORMATION

- EU Classification (CLASSIFICATION) PRODUCT : Not established
 - 1,3 BUTADIENE : F+; R12 Carc.Cat.1; R45 Muta.Cat.2; R46
- EU Classification (Risk Phrases) PRODUCT : Not established
 - 1,3 BUTADIENE : R12, R45, R46
- EU Classification (Safety Phrases) PRODUCT : Not established
 - 1,3 BUTADIENE : S:53-45
- 2006/507/EC PRODUCT : Not established
 - 1,3 BUTADIENE : Not established
- 689/2008/EC PRODUCT : Not established
 - 1,3 BUTADIENE : Not established
- Designation, Reportable Quantities, and Notification PRODUCT : Not established
 - 1,3 BUTADIENE : 10 lb final RQ; 4.54 kg final RQ

- Emergency Planning and Notification PRODUCT : Not established
 - 1,3 BUTADIENE : Not established
- Toxic Chemical Release Reporting – Community Right-to-Know PRODUCT : Not established
 - 1,3 BUTADIENE : 0.1 % de minimis concentration
- Process Safety Management of Highly Hazardous Chemicals PRODUCT : Not established
 - 1,3 BUTADIENE : Not established

16. OTHER INFORMATION

1. Reference

- ACGIH
- CRC Press Inc. Boca Raton. USA.
- EU CLP
- Environ. Toxicol. Chem. 11, 267–282.
- HSDB
- IARC
- IUCLID
- J Ind Hyg Toxicol 26; 69–78
- Journal of Health Science, 48 (1); 73–78
- MITI
- Mutagenesis 1, 449–452
- NTP
- OSHA
- Publication
- QSAR
- Study report

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- 0.0.0 : 2000.01.01
- 1.0.0 : 2010.05.20
- 2.0.0 : 2017.03.16
- 3.0.0 : 2018.01.31
- 4.0.0 : 2020.12.01

4. Other

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