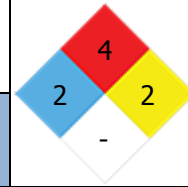




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1 Identification of the substance or mixture and of the supplier

1.1. Product name or GHS product identifier

1.1.1. Common name :	Butadiene (ENG.)
1.1.2. Chemical formula :	C ₄ H ₆
1.1.3. Commercial name :	1,3-Butadiene
1.1.4. CAS number :	106-99-0
1.1.5. Molecular weight :	54.09 g/mol

1.2. Other product identifier :

1.2.1. UN Number :	1010
1.2.2. Annex I, EU directive 67/948/EC :	-
1.2.3. EC number :	-

1.3. Recommendation for use and other prohibitions for use

-

1.4. Manufacturer or Supplier Details

1.4.1. Manufacturer or Supplier	1.4.2. Address
PTT Global Chemical company Limited	9,I-4 Road, Tambon Maptaphut, Amphoe Mueang Rayong, Rayong 21150, Thailand

1.4.3. Telephone number : 038-994000

1.5. Emergency telephone number : 5751

1.6. Other information

1.6.1. Hazardous substance Yes No

1.6.2. Hazardous category Hazard type 3

1.6.3. Max quantity storage -

1.6.4. Uses

Product gas is produced in plant during the synthesis of ethylene gas.

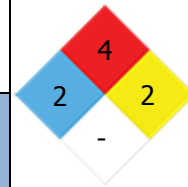
1.6.5. Other

-



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2

Hazards identification

2.1. GHS classification of the substance/mixture and any national or regional information

2.1.1. Hazard classification according to the GHS

Flammable gases - Category 1
Gases under pressure - Liquefied gas
Acute Toxicity: Inhalation - Category 4
Germ Cell Mutagenicity - Hazard category 1 (Both 1A and 1B)
Carcinogenicity - Hazard category 1 (Both 1A and 1B)

2.2. GHS label elements, including precautionary statements

2.2.1. Chemical name : 1,3-Butadiene (ENG.)

2.2.2. Product name or GHS product identifier : Butadiene (ENG.)

2.2.3. Symbol and Hazard pictograms



2.2.4. Signal words : **Danger**

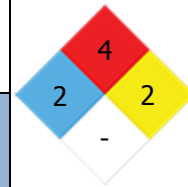
2.2.5. Hazard statement

Extremely flammable gas
Contains gas under pressure; may explode if heated
Harmful if inhaled
May cause genetic defects (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)
May cause cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)



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2

Hazards identification (cont.)

2.2.6. Precautionary information

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
Use personal protective equipment as required.
Use only outdoors or in well-ventilated area.
Avoid breathing dust/fume/gas/mist/vapours/spray.
Do not eat, drink or smoke when using this product.
Wash hands thoroughly after handling.
Store in well-ventilated place. Keep container tightly closed.
Protect from sunlight. Store in well-ventilated place.

2.2.7. Supplemental information

-

2.3. Other hazards which do not result in classification or are not covered by the GHS

frostbite

2.3.1. Potential Chronic Health Effects

2.3.1.1. Carcinogen effects

Maybe-Carcinogen Carcinogen Non-Carcinogen N/A

IARC classification of 1,3-butadiene is Class 1A (Risk of cancer depends on duration and level of exposure.)

2.3.1.2. Mutagenic effects

Mutagenic Non-Mutagenic N/A

Germ cell mutagen group: 1B (May cause genetic defects)

2.3.1.3. Other information

-

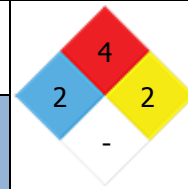
2.4. Environmental Hazards

-



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3

Composition / information on ingredients

3.1. Homogeneous substance

3.1.1. Chemical identity :	1,3-Butadiene
3.1.2. Common name :	Butadiene (ENG.)
3.1.3. Synonym :	-
3.1.4. CAS number and other unique identifiers :	106-99-0

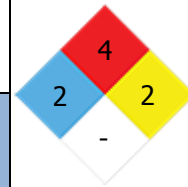
3.1.5. Impurities and stabilizing additives

-



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4

First-aid measures

4.1. First-aid

4.1.1. Inhalation

If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform artificial resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.

4.1.2. Skin contact

Immediately and thoroughly wash contaminated skin with soap and water at least 15 minutes. In case of cold burn, immediately place affected area in warm water (105 F) and keep at this temperature until circulation returns. Get medical attention.

4.1.3. Eyes contact

Immediately and thoroughly flush the eyes with large amounts of water for at least 15 minutes, occasionally lifting the lower and upper eyelids. If irritation, pain, swelling, lacrimation, or photophobia persists, get medical attention as soon as possible.

4.1.4. Ingestion

No emergency care anticipated. This material is a gas at standard temperature and pressure.

4.2. Most important symptoms/effects

4.2.1. Acute Effects

If frostbite has occurred, seek medical attention immediately.

4.2.2. Delayed effects

-

4.3. Indication of immediate medical attention

-

4.4. Special treatment needed, if necessary.

-

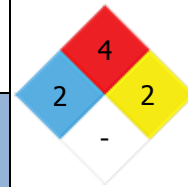
4.5. Other

Clothing contaminated with liquefied flammable gases may give rise to delayed evaporation and cause a subsequent fire hazard. Drench individual with water and remove contaminated clothing if possible. Slowly warm affected area of skin. Do not attempt to reheat rapidly.



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5

Firefighting measures

5.1. Unsuitable extinguishing media :

-

5.2. Suitable extinguishing media :

Use dry chemical or carbon dioxide to extinguish flames.
Use water spray to cool fire-exposed containers.

5.3. Specific hazards arising from the chemical.

Decomposition products may include the following materials: carbon dioxide, carbon monoxide

5.4. Special protective equipment and precautions for fire-fighters.

Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers

5.5. Precautions for fire fighters.

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

5.6. Other.

-

6

Accidental release measures

6.1. Personal precautions

Chemical protection suit including self-contained breathing apparatus.

6.2. Protective equipment



6.3. Emergency procedures

6.3.1. Large Spill

Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

6.3.2. Small Spill

Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

6.4. Environmental precautions

Prevent liquid from entering sewers.

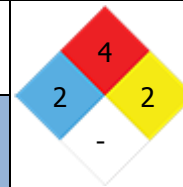
6.5. Methods and materials for containment and cleaning up.

Stay upwind and warn of possible downwind explosion hazard. Keep container tightly closed.



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7

Handling and storage

7.1. Precautions for safe handling.

Closed system, ventilation, explosion-proof electrical equipment and lighting.

7.2. Incompatibility.

7.2.1. Safe storage condition.

Keep away from heat, sparks, flame, and other sources of ignition.
Protect containers against static electricity, lightning, and physical damage.

7.2.2. Incompatible chemicals condition.

Do not contact with copper or copper alloys as explosive copper compounds may be formed.

7.3. Storage area :

GC3 BV Project

7.4. Incompatible chemicals condition.

-

7.5. Hazard Class by UN :

7.6. Classification :

2A

8

Exposure controls/personal protection

8.1. Occupational exposure limit values or biological limit values

Name	TLV-TWA	TLV-STEL	TLV-C	PEL	IDLH	Thai	biological limit values
1,3 Butadiene	2 ppm	5 ppm	-	1 ppm(2 .21mg/m3)	5 ppm (11 mg/m3)	1 ppm	-

8.2. Appropriate engineering controls

Store in well-ventilated place. Keep container tightly closed.

8.3. Personal protective equipment



8.4. Personal hygiene

Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product.

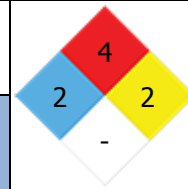
8.5. Other protection

IARC = 1 (Carcinogenic to humans)
IDLH = 2000 ppm



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9

Physical and chemical properties

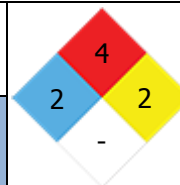
9.1. Appearance :	Gas Colourless gas		
9.2. Odour :	Aromatic odour		
9.3. Odour threshold limit :	- ppm		
9.4. pH-value :	7 neutral		
9.5. Melting point &Freezing point :	Melting point	- °C	
	Freezing point	-109 °C	
9.6. Initial boiling point/Boiling range	Boiling/condensation point	-4 °C	
	Evaporation rate	- °C -- °C	
9.7. Flash point :	-85°C °C (Close cup)		
9.8. Evaporation rate :	- mg/sec		
9.9. Flammability (solid, gas) :	Burning time	- sec	
	Burning Rate	- mm/sec	
9.10. Upper/lower flammability or explosive limits :	2 % LEL and/or 12 %UEL		
9.11. Vapour pressure :	21.35 psi kPa at 20 °C		
9.12. Vapour density :	Respect to air	1.9 kPa	
9.13. Relative density :	- g/cm3 or kg/m3 at - °C		
9.14. Solubility(ies) :	0.74 g/l		
9.15. Partition coefficient : n-octanol/water :	1.99		
9.16. Auto-ignition temperature :	420 °C		
9.17. Decomposition temperature :	- °C		
9.18. Viscosity :	-		
9.19. Heat of Combustion :	- °C		
9.20. The ignition distance test :	- cm		
9.21. The enclosed space ignition test	- s/m ³		
9.22. The foam test :	Vapor density	-	cm
	Flames burning up	-	sec

Detail	Type of Substance		Unit
	Other substance	Powders or dusts	
Use water spray to blanket fire, cool fire exposed containers, to stop leak, and burn	-	-	minute
Burning time	-	-	sec
Burning rate	-	-	mm/s



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10

Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical Stability :

- Stability Instability and emit gas N/A

10.3. Possibility of Hazardous reaction :

May spontaneously dimerize to 4-vinyl-1-cyclohexene in a temperature-dependent reaction.

10.4. Conditions to avoid :

Avoid proximity or contact with hot surfaces, flames, electrostatic charges or sparks. Do not store at a temperature exceeding 25 °C.

10.5. Incompatible materials :

Oxidizing agent. Acids. Halogens. Sulphur dioxide.

10.6. Hazardous decomposition products :

Thermal decomposition may produce : Carbon monoxide.
Carbon dioxide

10.7. Corrosivelyly :

-

11

Toxicological information

11.1. Route of Exposure Inhalation Ingestion Skin contact Eye contact

11.2. Symptoms related to the physical, chemical and toxicological characteristics

11.2.1. Symptom related with physical characteristic

frostbite

11.2.2. Symptom related with chemical characteristic

-

11.2.3. Symptom related with toxicology

frostbite

11. The impact of acute and delayed (delayed and immediate effects) including chronic (chronic effects) exposure (Contact delayed, immediate and chronic effects)

Skin contact with liquid product can cause frostbite (cold burns) .

11.4. Numerical measures of toxicity

11.4.1. Acute oral toxicity :

-

11.4.2. Acute dermal toxicity :

-

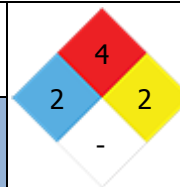
11.4.3. Acute toxic of the vapour :

LC50(4 hours) = 128000 ppm



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12

Ecological information

12.1. Eco toxicity (aquatic and terrestrial, where available)

12.1.1. Toxicity to fish :

-

12.1.2. Crustaceans / Toxicity to crustaceans :

-

12.1.3. Algae / Toxicity to algae :

-

12.2. Degradability and persistence

-

12.3. Bio-accumulative potential :

-

12.4. Mobility in soil :

Floats on water.

12.5. Other adverse effects :

-

13

Disposal considerations

13.1. Waste information :

-

13.2. Remain materials :

-

13.3. Waste disposal :

Disposal should be in accordance with applicable regional, national, and local laws and regulations.

13.4. Package contaminated disposal :

-

14

Transport information

14.1. UN Number :

1010

14.2. UN Proper Shipping Name :

BUTADIENES, STABILIZED or BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED, containing more than 40% butadienes

14.3. Transport Class/Division :

2.1

14.4. Package group (if any) :

14.5. Marine pollution :

Yes No N/A
-

14.6. Special precautionary for user :

Flammable gas

14.7. Transport in bulk :

-

14.8. Classification code :

14.9. Other :

-

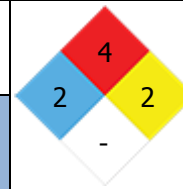
Pictogram





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15

Regulatory information

15.1. Safety, health and environmental regulations

Listed on IARC (International Agency for Research on Cancer)

16

Regulatory information

16.1. Date of latest issue


25/5/2020

16.2. Description of point of Safety Data Sheet changing

-

16.3. Abbreviation explanation

-

NFPA Hazard Code	HMIS Hazard	Rating System
Hazardous decomposition products  Health hazard Possibility of hazardous reactions Specific hazards arising from the chemical	2 Health	0 = No hazard 1 = Slight hazard 2 = Moderate hazard 3 = Serious hazard 4 = Severe hazard
	4 Flammability	
	2 Reactivity	

16.4. Information Safety Data Sheet files

Primary Reference :

Secondary Reference : [SDS-Butadiene Airgas.pdf](#)

16.5. Local Legislation Related

-

16.6. Reference

-

16.7. Other details

-

Butadiene (ENG.)

NFPA Rating



Emergency Call

5751

UN Number : 1010 CAS Number : 106-99-0

Flash point : -85°C Auto-ignition : 420°C

TWA-TLV : 2 ppm Classification :

Hazard Statement

Extremely flammable gas, May cause genetic defects, May cause cancer, (respiratory tract irritation) May cause respiratory irritation or (Narcotic effects) May cause drowsiness or dizziness, Causes damage to organs



Health Effects

May cause genetic defects
May cause cancer
(respiratory tract irritation) May cause respiratory irritation or (Narcotic effects) May cause drowsiness or dizziness
May cause damage to organs (state all organs affected, if known) through prolonged or repeated exposure (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)

Protective equipment

Respirators must be used where appropriate, Use hand protection in this area, Wear eye protection where appropriate, Face masks must be used where appropriate, Protective clothing must be worn



first aid

If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. Get medical attention as soon as possible.
Immediately and thoroughly wash contaminated skin with soap and water.
Immediately and thoroughly flush the eyes with large amounts of water for at least 15 minutes.
If frostbite has occurred, seek medical attention immediately.



Unsuitable extinguishing media

Use dry chemical or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers.



Hazardous Materials Handling and Storage

Closed system, ventilation, explosion-proof electrical equipment and lighting.
Keep away from heat, sparks, flame, and other sources of ignition. Protect containers against static electricity, lightning, and physical damage.
Do not contact with copper or copper alloys as explosive copper compounds may be formed.



Methods and materials for containment and cleaning up

Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment., Prevent liquid from entering sewers.

For more information please contact :

Code No. 10020329

Number of Revision :

12

Warning : DANGER

SHE Olefins II - 5740

Butadiene (ENG.)

UN No : 1010

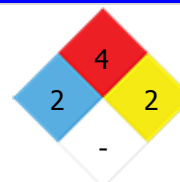
CAS No : 106-99-0



Signal words : Danger

Hazard statement :

Extremely flammable gas, May cause genetic defects, May cause cancer, (respiratory tract irritation) May cause respiratory irritation or (Narcotic effects) May cause drowsiness or dizziness, Causes damage to organs



First Aid :

If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. Get medical attention as soon as possible. Immediately and thoroughly wash contaminated skin with soap and water. Immediately and thoroughly flush the eyes with large amounts of water for at least 15 minutes. If frostbite has occurred, seek medical attention immediately.

Precautionary information :

Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Use personal protective equipment as required. Use only outdoors or in well-ventilated area. Avoid breathing dust/fume/gas/mist/vapours/spray. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Store in well-ventilated place. Keep container tightly closed. Protect from sunlight. Store in well-ventilated place.

Emergency number :

5751

Manufacturer or Supplier Details

Company : PTT Global Chemical company Limited

Address : 9,I-4 Road, Tambon Maptaphut, Amphoe Mueang Rayong, Rayong 21150, Thailand

Telephone number : 038-994000

Protective equipment

