	MSDS	ISSUE DATE	Juene-2020
	1,3 BUTADIENE	WWW.TPCO.IR	
IRAN/TABRIZ/TABRIZ PETROCHEMICAL COMPANY/P.O.BOX:51745-354/TEL:+984134282612		Page:1/8	

1. Chemical Product And Company Identification:

Product Name: 1-3-butadiene

CAS No: 106-99-0

Chemical Name: 1-3-butadiene

Company Identification: Iran-Tabriz petrochemical company

2. Composition, Information on Ingredients:

Toxicological Data on Ingredients: ORAL (LC50/EC50/IC50):

Acute: between 10 and 100 mg/L in the most sensitive species.

3. Hazards Identification:

Potential Acute Health Effects:

Skin corrosion/irritation

Liquid may cause frostbite upon skin contact.

Serious eye damage/eye irritation

Vapor may cause eye irritation experienced as mild discomfort and redness.

Liquid may cause frostbite.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

In animals, effects have been reported on the following organs:

Bone marrow.

Spleen.

Kidney.

Liver.

Ovaries.

Respiratory tract.

Testes.

4. First Aid Measures:

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin contact: In case of frostbite, immediately flush skin with plenty of water for 15 minutes. Seek medical attention. Suitable emergency safety shower facility should be immediately available.


Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist. In case of frostbite, immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention promptly, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

Ingestion: In case of frostbite, immediately rinse lips and mouth with tepid water for at least 15 minutes. Obtain medical attention promptly.

5. Fire Fighting Measures:

5.1 Extinguishing media

Suitable extinguishing media: Do not extinguish. Stop flow of product and allow fire to burn out. Once product flow has stopped, small fires may be extinguished with: Water fog or fine spray, Dry chemical fire extinguishers and Carbon dioxide fire extinguishers or Foam.

	MSDS	ISSUE DATE	Juene-2020
	1,3 BUTADIENE	WWW.TPCO.IR	
IRAN/TABRIZ/TABRIZ PETROCHEMICAL COMPANY/P.O.BOX:51745-354/TEL:+984134282612		Page:2/8	

Unsuitable extinguishing media: No data available

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating.

Unusual Fire and Explosion Hazards: Container may vent and/or rupture due to fire. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur.

5.3 Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Do not extinguish. If flames are accidentally extinguished, explosive re-ignition may occur. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of resumption has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Eliminate ignition sources. For spills of liquefied gas, apply appropriate foam or vapor suppressing agent. Warning! Contact of water with liquefied gas can result in boiling, frothing, and rapid generation of vapor. For vapor cloud, use water spray to knock down and control dispersion of vapors.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. Accidental Release Measures:

6.1 Personal precautions, protective equipment and emergency procedures: Evacuate area. Refer to section 7, Handling, for additional precautionary measures. Only trained and properly protected personnel must be involved in clean-up operations. Keep personnel out of low areas. Keep personnel out of confined or poorly ventilated areas and leak or spill. For large spills, warn public of downwind explosion hazard. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Check area with combustible gas detector before reentering area. Ground and bond all containers and handling equipment. Vapor explosion hazard. Keep out of sewers. Spills of this liquefied gas may form ice, which can plug drains and can make valves inoperable. Contact of water with liquefied gas can result in boiling, frothing, and rapid generation of vapor. See Section 10 for more specific information. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.


6.2 Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

6.3 Methods and materials for containment and cleaning up: Ground and bond all containers and handling equipment. Stop flow of gas. Isolate area until gas has dispersed. Use fine water spray to reduce vapors. If available, use foam to smother or suppress vapors. Apply vapor suppression foams until spill can be cleaned up. Knock down and dilute vapors with water fog or spray. See Section 13, Disposal Considerations, for additional information.

6.4 Reference to other sections: References to other sections, if applicable, have been provided in the previous sub-sections.

7. Handling and Storage:

7.1 Precautions for safe handling: Keep away from heat, sparks and flame. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Electrically bond and ground all containers and equipment before transfer or use of material. No smoking in area. Wash thoroughly after handling. Avoid breathing vapor. Keep container closed. Do not enter confined spaces unless adequately ventilated. Never use air pressure for transferring product and Contents under pressure. Do not puncture or incinerate container.

	MSDS	ISSUE DATE	Juene-2020
	1,3 BUTADIENE	WWW.TPCO.IR	
		IRAN/TABRIZ/TABRIZ PETROCHEMICAL COMPANY/P.O.BOX:51745-354/TEL:+984134282612	
		Page:3/8	

Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. See Section 8, exposure controls and personal protection. This product is a poor conductor of electricity and can become electrostatic all charged, even in bonded or grounded equipment. If sufficient charge is accumulated, ignition of flammable mixtures can occur. Handling operations that can promote accumulation of static charges include but are not limited to mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations.

Never use air pressure for transferring product. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur.

7.2 Conditions for safe storage, including any incompatibilities: No smoking or open flame in storage area. Uninhibited monomer vapors can polymerize and plug relief devices. Maintain inhibitor level. Purge oxygen from storage vessels before filling. Hold bulk storage under nitrogen blanket. Store away from incompatible materials. See stability and reactivity section. See Section 10 for more specific information.

7.3 Specific end use(s): See the technical data sheet on this product for further information

8. Exposure Controls, Personal Protection:

8.1 Control parameters

Exposure limits are listed below, if they exist.

Component Regulation Type of listing Value/Notation

- 1, 3-butadiene OSHA TWA 1 PPM
- 2-methylpropene OSHA TWA 800 PPM
- But-1-ene ACGIH TWA 250 PPM
- Butane OSHA TWA 20 PPM
- (E)-But-2-ENE ACGIH TWA 250 PPM
- (Z)-But-2-ENE (cis-2- butene)
ACGIH TWA 250 PPM
- Isobutene OSHA TWA 800 PPM
- 4-tert-Butylcatechol US WEEL CEIL 2 MG/M₃

Individual protection measures


Eye/face protection: For handling the gas, wear safety glasses (with side shields). When contact with the liquid (condensed gas) is possible, wear chemical goggles. Safety glasses (with side shields) should be consistent with EN 166 or equivalent. Chemical goggles should be consistent with EN 166 or equivalent. If exposure causes eye discomfort, use a full-face respirator.

Skin protection

Hand protection: Use an insulated glove for protection from liquid contact of the skin that may cause frostbite due to rapid cooling. Use gloves with insulation for thermal protection (EN 407), when needed.

5. Other protection: Wear clean, body-covering clothing.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. When respiratory protection is required, use an approved positive-pressure self-contained breathing apparatus or positive pressure airline with auxiliary self-contained air supply. For emergency conditions, use an approved positive pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.

	MSDS	ISSUE DATE	Juene-2020
	1,3 BUTADIENE	WWW.TPCO.IR	
IRAN/TABRIZ/TABRIZ PETROCHEMICAL COMPANY/P.O.BOX:51745-354/TEL:+984134282612		Page:4/8	

Environmental exposure controls

See SECTION 7: Handling and storage and SECTION 13: Disposal considerations for measures to prevent excessive environmental exposure during use and waste disposal.

9. Physical and Chemical Properties:

9.1 Information on basic physical and chemical properties

Appearance:

Physical state Liquefied gas

Color Colorless

Odor pungent

Odor Threshold No test data available

PH Not applicable

Melting point/range Not applicable to liquids

Freezing point -109 °C *Literature* (based on major component)

Boiling point (760 mmHg) -5 - 0 °C *Estimated.*

Flash point closed cup -76 °C *Estimated.*

Evaporation Rate (Butyl Acetate=1) No test data available

Flammability (solid, gas) Flammable

Lower explosion limit 2 % vol *Estimated.*

Upper explosion limit 12 % vol *Estimated.*

Vapor Pressure 2,450 mbar at 20 °C *Literature* (based on major component)

Relative Vapor Density (air = 1) 2 at 15 °C *Estimated.*

Relative Density (water = 1) 0.58 - 0.62 at 20 °C *Estimated.*

Water solubility insoluble

Auto-ignition temperature 420 °C *Literature* (based on major component)

Decomposition temperature No test data available

Dynamic Viscosity Not applicable

Kinematic Viscosity No data available

Explosive properties No data available

Oxidizing properties No data available

9.2 Other information

Liquid Density 0.58 - 0.62 g/cm³ at 15 °C *Literature*

Molecular weight No test data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. Stability and Reactivity:

10.1 Reactivity: No data available


10.2 Chemical stability: Stable under recommended storage conditions. See Storage, Section 7. Unstable at elevated temperatures.

10.3 Possibility of hazardous reactions: Can occur. Elevated temperatures can cause hazardous polymerization. Maintain inhibitor level. Monomer contaminated with peroxides can form polymer at ambient conditions. Dry polymer containing peroxides at greater than 15% concentration can be detonated by slight mechanical shock or heat. Uninhibited monomer vapors can polymerize and plug relief devices.

10.4 Conditions to avoid: Avoid contact with air to prevent formation of explosive peroxides. Avoid static discharge.

Inhibitor: 4-tert-Butylcatechol

10.5 Incompatible materials: Avoid contact with oxidizing materials. Avoid contact with: Air. Avoid unintended contact with Peroxides.

	MSDS	ISSUE DATE	Juene-2020
	WWW.TPCO.IR		
	1,3 BUTADIENE	IRAN/TABRIZ/TABRIZ PETROCHEMICAL COMPANY/P.O.BOX:51745-354/TEL:+984134282612 Page:5/8	

10.6 Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials.

11. Toxicological Information:

Acute toxicity

Acute oral toxicity

Swallowing is unlikely because of the physical state. Liquid may cause frostbite of the lips and mouth. Single dose oral LD50 has not been determined.

Acute dermal toxicity

Skin absorption is unlikely due to physical properties. The dermal LD50 has not been determined.

Acute inhalation toxicity

In confined or poorly ventilated areas, vapor can readily accumulate and can cause unconsciousness and death. Excessive exposure may cause irritation to upper respiratory tract (nose and throat). Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. Excessive exposure may increase sensitivity to epinephrine and increase myocardial irritability (irregular Heartbeats).

Typical for this family of materials. LC50, Rat, 4 Hour, vapour, > 5.3 mg/l

Skin corrosion/irritation

Liquid may cause frostbite upon skin contact.

Serious eye damage/eye irritation

Vapor may cause eye irritation experienced as mild discomfort and redness. Liquid may cause frostbite.

Sensitization

For skin sensitization:

No relevant data found.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

In animals, effects have been reported on the following organs:

Bone marrow.

Spleen.

Kidney.

Liver.

Ovaries.

Respiratory tract.

Testes.

Carcinogenicity


Has caused cancer in laboratory animals. Butadiene epidemiology studies have linked employment in two different chemical operations each with a different type of cancer. The causative factors for these excess cancers have not been determined.

Teratogenicity

Contains component(s) which caused birth defects in laboratory animals only at doses toxic to the mother. Contains component(s) which, in laboratory animals, have been toxic to the fetus at doses nontoxic to the mother.

Reproductive toxicity

In animal studies, did not interfere with reproduction.

	MSDS	ISSUE DATE	Juene-2020
	1,3 BUTADIENE	WWW.TPCO.IR	
		IRAN/TABRIZ/TABRIZ PETROCHEMICAL COMPANY/P.O.BOX:51745-354/TEL:+984134282612 Page:6/8	

Mutagenicity

In vitro genetic toxicity studies were positive. Animal genetic toxicity studies were positive.

Aspiration Hazard

Based on available information, aspiration hazard could not be determined.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Hydrocarbons, C4, ethylene-manuf.-by-product

Acute toxicity to fish

For this family of materials:

Material is harmful to aquatic organisms (LC50/EC50/IC50 between 10 and 100 mg/L in the most sensitive species).

12.2 Bioaccumulative potential

Hydrocarbons, C4, ethylene-manuf.-by-product

Bioaccumulation: For this family of materials: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water (log POW): 1.99 - 2.89 Measured

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

This product, when being disposed of in its unused and uncontaminated state should be treated as a hazardous waste according to EC Directive 2008/98/EC. Any disposal practices must be in compliance with all national and provincial laws and any municipal or local by-laws governing hazardous waste. For used, contaminated and residual materials additional evaluations may be required. Do not dump into any sewers, on the ground, or into any body of water.

14. TRANSPORT INFORMATION

Classification for ROAD and Rail transport (ADR/RID):

14.1 UN number UN 1010

14.2 UN proper shipping name BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED

14.3 Transport hazard class (ES) 2.1

14.4 Packing group Not applicable

14.5 Environmental hazards Not considered environmentally hazardous based on available data

14.6 Special precautions for user Hazard Identification Number: 239

Classification for INLAND waterways (ADNR/ADN):

14.1 UN number UN 1010

14.2 UN proper shipping name BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED

14.3 Transport hazard class (ES) 2.1 (CMR, unset)

14.4 Packing group Not applicable

14.5 Environmental hazards Not considered environmentally hazardous based on available data.

14.6 Special precautions for user No data available.

Classification for SEA transports (IMO-IMDG):

14.1 UN number UN 1010


14.2 UN proper shipping name BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED

14.3 Transport hazard class (ES) 2.1

14.4 Packing group Not applicable

14.5 Environmental hazards Not considered as marine pollutant based on available data.

14.6 Special precautions for user EmS: F-D, S-U

	MSDS	ISSUE DATE	Juene-2020
	1,3 BUTADIENE	WWW.TPCO.IR IRAN/TABRIZ/TABRIZ PETROCHEMICAL COMPANY/P.O.BOX:51745-354/TEL:+984134282612 Page:7/8	

14.7 Transport in bulk according Consult IMO regulations before transporting ocean bulk **to Annex I or II of MARPOL 73/78 and the IBC or IGC**

Code Classification for AIR transport (IATA/ICAO):

14.1 UN number UN 1010

14.2 UN proper shipping name Butadiene and hydrocarbon mixture, stabilized

14.3 Transport hazard class (ES) 2.1

14.4 Packing group Not applicable

14.5 Environmental hazards Not applicable

14.6 Special precautions for user No data available

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION


15.1 Safety, health and environmental regulations/legislation specific for the substance or Mixture

Reach Regulation (EC) No 1907/2006

Polymers are exempted from registration under REACH. All relevant starting materials and additives have been either pre-registered, registered, or are exempt from registration to Regulation (EC) No. 1907/2006 (REACH). The aforementioned indications of the REACH registration status are provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. It is the buyer's/user's responsibility to ensure that his/her understanding of the regulatory status of this product is correct.

Restrictions on the manufacture, placing on the market and use:

The following substance/s contained in this product is/are subject through Annex XVII of REACH regulation to restrictions on the manufacture, placing on the market and use when present in certain dangerous substances, mixtures and articles. Users of this product have to comply with the restrictions placed upon it by the aforementioned provision.

	MSDS	ISSUE DATE	Juene-2020
	1,3 BUTADIENE	WWW.TPCO.IR	
IRAN/TABRIZ/TABRIZ PETROCHEMICAL COMPANY/P.O.BOX:51745-354/TEL:+984134282612		Page:8/8	

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

- H220 Extremely flammable gas.
- H224 Extremely flammable liquid and vapour.
- H280 Contains gas under pressure; may explode if heated.
- H302 Harmful if swallowed.
- H312 Harmful in contact with skin.
- H314 Causes severe skin burns and eye damage.
- H317 May cause an allergic skin reaction.
- H340 May cause genetic defects.
- H350 May cause cancer.
- H400 Very toxic to aquatic life.
- H410 Very toxic to aquatic life with long lasting effects.

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