

Butadiene

 C_4H_6

Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Name of product	1,2-Butadiene
	Art-Nr(n): 2205
Name of substance	1,2-butadiene
EC No	209-674-2
REACH registration number	01-2119458051-48
CAS No	590-19-2

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses

Sector of uses [SU]

SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys).
 SU8 - Manufacture of bulk, large scale chemicals (including petroleum products). SU9
 - Manufacture of fine chemicals

Product categories [PC]

PC19 - Intermediate

Process categories [PROC]

PROC1 - Use in closed process, no likelihood of exposure.
 PROC2 - Use in closed, continuous process with occasional controlled exposure.
 PROC3 - Use in closed batch process (synthesis or formulation).
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises.
 PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at no dedicated facilities.
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing).
 PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelletisation. PROC8b
 - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
 PROC15 - Use as laboratory reagent

Recommended intended purpose(s)

Basic substance.

1.3. Details of the supplier of the safety data sheet

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to 67/548/EEC or 1999/45/EC

F+; R12 **R-phrases** 12 Extremely
 flammable.

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

Manufacture/Distributor:

Ehsan International Gases

40/9, Aurangabad, Nazimabad
 #3, Karachi 74600, Pakistan.
 +92 21 36612091 – 36612907

info@ehsan.com.pk

www.ehsan.com.pk

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Hazard classes and Hazard Statements Classification procedure categories

Flam. Gas 1	H220
Liquef. Gas	H280
Hazard statements for physical hazards	
H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]



GHS02



GHS04

Signal word

Danger

Hazard statements for physical hazards

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.

Precautionary Statements**Prevention**

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

Response

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.

2.3. Other hazards**Information pertaining to special dangers for human and environment**

In high concentrations may cause asphyxiation.

Can form explosive mixture with air.

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level. Contact with liquid may cause cold burns/frostbite.

Composition/ information on ingredients**3.1. Substances**

CAS No 590-19-2	1,2-butadiene
EC No 209-674-2	
REACH registration number 01-2119458051-48	

3.2. Mixtures

not applicable

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First aid measures

4.1. Description of first aid measures

General information

Remove contaminated soaked clothing immediately.
Adhere to personal protective measures when giving first aid.
Seek medical advice immediately.

In case of inhalation

Remove the casualty into fresh air and keep him immobile.
Seek medical treatment immediately.
In case of respiratory standstill give artificial respiration by respiratory bag (Ambu bag) or respirator. Send for a doctor.

In case of skin contact

In case of contact with skin wash off with warm water.
In case of frostbite rinse with plenty of water. Don't remove clothing.
In case of frostbite spray with lukewarm (not hot) water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.

In case of eye contact

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Call for a doctor immediately.

In case of ingestion

Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No information available.

4.3. Indication of any immediate medical attention and special treatment needed

Treatment (Advice to doctor) Treat symptoms.
Monitor circulation.

Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

Dry powder
Carbon dioxide

Unsuitable extinguishing media

Full water jet

5.2. Special hazards arising from the substance or mixture

In case of fire formation of dangerous gases possible.
Formation of explosive gas mixtures in air.
In the event of fire the following can be released:
Carbon monoxide (CO)

5.3. Advice for firefighters

Special protective equipment for fire-fighters

Use breathing apparatus with independent air supply (isolated). Wear full protective clothing.

Additional information

Cool endangered containers with water spray jet.
Exposure to fire may cause containers to rupture / explode.

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Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur.
Extinguish any other fire.

! SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

See chapter 8.

Evacuate area.

Keep away sources of ignition.

6.2. Environmental precautions

If possible, stop flow of product.

Eliminate ignition sources.

Do not discharge into the drains/surface waters/groundwater.

Prevent spread over a wide area (e.g. by containment or oil barriers).

Do not discharge into the subsoil/soil.

6.3. Methods and material for containment and cleaning up

Ensure adequate air ventilation. Allow to vaporise.

6.4. Reference to other sections

Safe handling: see section 7

Personal protection equipment: see section 8

! SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Use only in thoroughly ventilated areas.

Transfer and handle only in enclosed systems.

The working pressure in the receptacle must not exceed the saturation vapour pressure of the pure product resulting at a temperature of 50 °C.

Barrels and installations thoroughly earthing (grounding).

Use antistatic tools.

Treatment only in suitable rooms and systems.

Provide good room ventilation even at ground level (vapours are heavier than air).

Prevent cylinders from falling over.

Ensure valve protection device is correctly fitted.

Ensure valve outlet cap nut or plug (where provided) is correctly fitted.

Open valve slowly to avoid pressure shock.

Do not allow backfeed into the container.

Suck back of water into the container must be prevented.

No water to valves, flanges and other fittings.

Purging of pipes and valves with inert gases - to avoid: water, solvents.

General protective measures Do not

inhale gases/vapours/aerosols.

Hygiene measures

At work do not eat, drink and smoke.

Advice on protection against fire and explosion

The product is combustible.

Because of risk of explosion avoid vapours getting into cellar, sewage system and holes. Take precautionary measures against static discharges.

Formation of explosive gas mixtures in air.

Use explosion-proof equipment / fittings and non-sparking tools.

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7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep in closed original container.

Ventilate store-rooms thoroughly.

Use transportable pressure equipment.

Suitable materials: Normalised steel and carbon steel, tempered steel, aluminium alloys, stainless steel. Valve:

Suitable materials: Brass, copper alloys, carbon steels, aluminium alloys, stainless steel.

Advice on storage compatibility

Do not store with spontaneously flammable materials.

Do not store together with combustible liquids or combustible solids.

Do not store together with animal feedstuffs.

Do not store together with explosives.

Do not store together with infectious substances.

Do not store together with radioactive material.

Do not store together with toxic liquids or toxic solids.

Do not store together with food.

Do not store together with oxidizing liquids or oxidizing solids.

Further information on storage conditions

Ensure valve protection device is correctly fitted.

Keep container tightly closed and store at cool and aired place.

Prevent cylinders from falling over.

Storage temperature may not exceed 50°C (=122°F).

7.3. Specific end use(s)

! Recommendation(s) for intended use

No further recommendations.

! SECTION 8: Exposure controls/personal protection

8.1. Control parameters

! Additional advice

DNEL (workers, inhalation, long-term, systemic effects): 371 mg/m³.

DNEL (consumers, inhalation, long-term, systemic effects): 79 mg/m³.

8.2. Exposure controls

! Respiratory protection

Keep self contained breathing apparatus readily available for emergency use.

In case of rescue and maintenance activities in storage containers use environment-independent breathing apparatus because of risk of suffocation by edging out of air oxygen

Short-term: filter apparatus, filter AX, otherwise environment-independent breathing apparatus.

! Hand protection

Leather gloves

NBR gloves

Glove material specification [make/type, thickness, permeation time/life]: FKM, >= 0,7 mm, > 480 min

! Eye protection

Safety goggles, in case of increased risk add protective face shield

! Skin protection

Safety shoes with steel toe.

Body covering work clothing, or chemical resistant suit at increased risk.

! Limitation and surveillance of the environment

See chapter 7.

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Transfer and handle only in enclosed systems.

! SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Form Gaseous / liquefied under pressure.
Colour colourless

Odour
sweetish

! Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value in delivery state	not applicable				
boiling point	10,8 °C		1013 hPa		
melting point	-136 °C				
Flash point	< -50 °C				
Ignition temperature	340 °C			DIN 51794	
Lower explosion limit	1,6 Vol-%				
Upper explosion limit	18,3 Vol-%				
Vapour pressure	1410 hPa	20 °C			
Relative density	0,65 g/cm ³	20 °C			liquid phase
Vapour density	1,87				air = 1
Solubility in water	0,1 g/l	20 °C			
Solubility/other					soluble in organic solvent
Partition coefficient (log p_{OW})	1,99	20 °C			
Viscosity dynamic	0,19 mPa*s	0 °C			liquid phase
Viscosity dynamic	6,8 uPa*s	0 °C			vapour phase
Oxidising properties	no				

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9.2. Other information

Vapours are heavier than air.

! SECTION 10: Stability and reactivity

10.1. Reactivity

See section "Possibility of hazardous reactions".

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Reactions with oxidising agents.

Reactions with peroxides and other radical components.

10.4. Conditions to avoid

Formation of explosive gas/air mixtures.

Heat sources / heat - risk of bursting.

10.5. Incompatible materials

! Materials to avoid

Peroxide

Oxidising agent

10.6. Hazardous decomposition products

Carbon monoxide

Thermal decomposition

Remark May decompose violently at temperature ≥ 70 °C and pressure ≥ 7 bar.

! SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity/Irritability/Sensitization

	Value/Validation	Species	Method	Remark
LC50 acute inhalation	17,7 mg/l (4 h)	rat		
Irritability skin	non-irritant			
Irritability eye	non-irritant			
Skin sensitization	non-sensitizing			

Subacute Toxicity - Carcinogenicity

	Value	Species	Method	Validation
Sub chronic Toxicity	NOAEL 2,212 mg/l (2 a)	Rat (male / female)	OECD 453	No effects of toxicological significance.

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Inhalation

Mutagenicity

OECD 476

Information on genotoxicity in

vitro available.

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Value	Species	Method	Validation
Reproduction-Toxicity			No indication of teratogenic effects (conclusion by analogy).

Carcinogenicity not determined

! Aspiration hazard
not applicable

! Toxicity test (Additional information)
No experimental indication of genotoxicity in vitro (Ames-test negative).

Experiences made from practice
May cause frostbite.
Gases have a suffocating effect.
Inhalation causes narcotic effect/intoxication.

! SECTION 12: Ecological information

12.1. Toxicity

Eco toxicological effects

Value	Species	Method	Validation
Fish			
not applicable			
Daphnia			
EC50 7,3 mg/l (48 h)	Daphnia magna		The product was tested above its maximum solubility.
Algae			
not applicable			
Bacteria			
not applicable			

12.2. Persistence and degradability

Physico-chemical degradability

At normal temperature very highly volatile or gaseous product that can be released to atmosphere.
Elimination test cannot be employed.

Biological

readily degradable

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degradability

**Biological
eliminability** not determined

12.3. Bio accumulative potential

Because of the n-octane/water distribution coefficient (log K_{ow}) accumulation in organisms is not expected.

12.4. Mobility in soil

high mobility

Adsorption in the soil is not likely.

12.5. Results of PBT and pub assessment

This substance does not meet the PBT/pub criteria of REACH, annex XIII.

12.6. Other adverse effects

Not known.

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SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste code No.

16 05 04*

Name of waste

gases in pressure containers (including haloes) containing dangerous substances

Wastes marked with an asterisk are considered to be hazardous waste pursuant to Directive 91/689/EEC on hazardous waste.

Recommendations for the product

Dispose of as hazardous waste.

Recommendations for packaging

Transportable pressure equipment (empty, residual pressure): Return to supplier / manufacturer.

! SECTION 14: Transport information

Land and inland navigation transport ADR/RID

UN 1010 BUTADIENES, STABILIZED, 2.1, (B/D), Classification code: 2F

Marine transport IMDG

UN 1010 BUTADIENES, STABILIZED, 2.1

Air transport ICAO/IATA-DGR

UN 1010 Butadiene's, stabilized, 2.1

Special precautions for user

The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

not applicable

No transport as bulk according IBC - Code.

! SECTION 15: Regulatory information

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

! Other regulations (EU)

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), Annex XVII No 40.

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Directive 96/82/EC on the control of major-accident hazards involving dangerous substances.

VOC standard

VOC content >=99,5 % 20 °C 1410 hPa

15.2. Chemical Safety Assessment

The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered. For this substance a chemical safety assessment has been carried out.

An exposure scenario is not required.

! SECTION 16: Other information**Recommended uses and restrictions**

National and local regulations concerning chemicals shall be observed.

! Further information

All declarations of safety-data-sheet refer to pure substance.

The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product. Indication of changes: "!" = Data changed compared with the previous version.

Wording of the R/H-phrases specified in chapter 3 (not the classification of the mixture!)

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R 12 Extremely flammable.

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.