

**Butene****C<sub>4</sub>H<sub>8</sub>****1. Identification of the substance/mixture and of the company/undertaking**

<b>Product identifier</b>	
<b>Name of product</b>	But-1-ene Art-Nr.: 2410
<b>Name of substance</b>	butene
<b>Index No</b>	601-012-00-4
<b>EC No</b>	203-449-2
<b>REACH registration number</b>	01-2119456615-34
<b>CAS No</b>	106-98-9

**Identified uses****Sector of uses [SU]**

SU8 - Manufacture of bulk, large scale chemicals (including petroleum products). SU9 - Manufacture of fine chemicals.

**Product categories [PC]** not applicable

**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).

PROC6 - Calendaring operations.

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.

PROC21 - Low energy manipulation of substances bound in materials and/or articles.

**Recommended intended purpose(s)** Basic substance.

**2. Hazards identification****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]**

Hazard classes and Hazard      Hazard Statements

**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.

**Manufacture/Distributor:****Ehsan International Gases**

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+92 21 36612091 – 36612907

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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.

**Hazardous ingredients for labeling butene****Information pertaining to special dangers for human and environment** In high concentrations may cause asphyxiation.

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

**3. Composition/information on ingredients**CAS No 106-98-9                                  butene  
EC No 203-449-2  
Index No 601-012-00-4  
REACH registration number 01-2119456615-34**4. 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.

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**Treatment (Advice to doctor)** Monitor circulation.

### 5. Firefighting measures

**Suitable extinguishing media**

Foam  
Dry powder  
Carbon dioxide  
Water spray jet

**Extinguishing media which must not be used for safety reasons** Full water jet

**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)

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

### 6. Accidental release measures

**Personal precautions** See chapter 8.  
Keep away sources of ignition.

**Environmental precautions**

If possible, stop flow of product.  
Eliminate ignition sources.  
Do not discharge into the drains/surface waters/groundwater. Do not discharge into the subsoil/soil.

**Methods for cleaning up** Ensure adequate air ventilation. Allow to vaporise.

**Additional Information**

Informations for safe handling see chapter 7.  
Informations for personal protective equipment see chapter 8.

### 7. Handling and storage

**Advice on safe handling**

Use only in thoroughly ventilated areas.  
Transfer and handle only in enclosed systems.  
Take measures against electrostatically charging.  
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.

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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.

**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.

**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 feedstuff.  
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. Keep container in a well-ventilated place Protect of heat.  
Storage temperature may not exceed 50°C (=122°F).

**Information on storage stability**  
At appropriate storage unlimited stability.

**Recommendation(s) for intended use** no

**8. Exposure controls/personal protection****Additional advice**

DNEL (workers, inhalation, 8 h): 769 mg / m<sup>3</sup> (335 ppm), long-term (repeated uptake) - systemic effects (toxicity). DNEL (workers, inhalation, 8 h): 1530 mg/m<sup>3</sup> (667 ppm), long-term (repeated uptake) - local effects (toxicity).

**Respiratory protection**

Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.  
Keep self contained breathing apparatus readily available for emergency use.  
In case of low concentrations in the breathing air: short term: filter apparatus, filter AX.

**Hand protection**

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

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**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.

**General protective measures**

Do not inhale gases/vapours/aerosols.

**Hygiene measures**

At work do not eat, drink and smoke.

**Limitation and surveillance of the environment** PNEC: not

required, because the substance is gaseous.  
See chapter 7.

### 9. Physical and chemical properties

**Form**

Gaseous / liquefied under pressure.

**Colour**

colourless

**Odour**

sweetish

**Important health, safety and environmental information**

	Value	Temperature	at	Method	Remark
<b>pH value in delivery state</b>	not applicable				

**Safety Data Sheet according to Regulation (EC)  
No. 1907/2006 (REACH)**

Printed 19.12.2011  
Revision 14.12.2011 (GB) Version 6.0 **But-1-ene**  
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	Value	Temperature	at	Method	Remark
<b>Acid number</b>	not applicable				
<b>boiling point</b>	-6,1 °C		1013 hPa		
<b>melting point</b>	-185 °C				
<b>Flash point</b>	< -40 °C			DIN 51755	
<b>Flammable solid</b>	not applicable				
<b>Ignition temperature</b>	384 °C			DIN 51794	
<b>Lower explosion limit</b>	1,6 Vol-%				
<b>Upper explosion limit</b>	10 Vol-%				
<b>Vapour pressure</b>	2545 hPa	20 °C			
<b>Density</b>	0,59 g/cm <sup>3</sup>	20 °C			liquid phase
<b>Rel. vapour density</b>	1,9				
<b>Solubility in water</b>	0,5 g/l	20 °C			
<b>Solubility/other</b>					soluble in organic solvent
<b>Partition coefficient (log p<sub>OW</sub>)</b>	2,42				

**Additional information**

Vapours are heavier than air.

## 10. Stability and reactivity

**Conditions to avoid**

Formation of explosive gas/air mixtures.  
Heat sources / heat - risk of bursting.  
Sources of ignition.

**Materials to avoid**

Reactions with oxidising agents.

**Hazardous decomposition products** No  
hazardous decomposition products known.

**Thermal decomposition**

Remark No decomposition if used as directed.

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**Additional information** Stable under normal conditions.

### 11. Toxicological information

#### Acute toxicity/Irritability/Sensitization

Value/Validation	Species	Method	Remark
<b>LC50 acute inhalation</b> > 10000 ppm (4 h)	rat (male / female)	OECD 403	
<b>Irritability skin</b>	not determined		
<b>Irritability eye</b>	not determined		
<b>Skin sensitization</b>	not determined		
<b>Sensitization respiratory system</b>	not determined		

#### Subacute Toxicity – Carcinogenicity

Value	Species	Method	Validation
<b>Subchronic Toxicity</b> NOAEL > 18,4 mg/l (28 d) Inhalation	Rat (male / female)	OECD TG 422	
<b>Mutagenicity</b>			No experimental information on genotoxicity in vitro and in vivo available.
<b>Reproduction-Toxicity</b> NOAEL > 18,4 mg/l Inhalation	Rat (male / female)	OECD TG 422	No indications of toxic effects were observed in reproduction studies in animals.

#### Toxicity test (Additional information)

No experimental indication of genotoxicity in vitro ( Ames-test negative ).  
No experimental indication of genotoxicity in vivo (micronucleus test negative ).  
No indication of cancerogenic effects (conclusion by analogy).

#### Experiences made from practice

May cause frostbite.  
Gases have a suffocating effect.  
Inhalation causes narcotic effect/intoxication.

### 12. Ecological information

**Data on elimination (persistence and degradability)** Elimination rate Method of analysis  
Method Validation

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Elimination rate

Method of analysis

Method

Validation

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### Biological degradability

QSAR

readily degradable

### Biological Physico-chemical degradability

not determined

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

### eliminability

### Mobility and bioaccumulative potential

The product has not been tested. Because of the product's consistency and low solubility in water bioavailability is not likely.

### Ecotoxicological effects

	Value	Species	Method	Validation
<b>Fish</b>	not applicable			The product is highly volatile.
<b>Daphnia</b>	not applicable			The product is highly volatile.
<b>Algae</b>	not applicable			The product is highly volatile.
<b>Bacteria</b>	not applicable			The product is highly volatile.

### General regulation

This substance does not meet the PBT/vPvB criteria of Annex VIII of the Regulation (EC) No 1907/2006 (REACH).

## 13. Disposal considerations

### Waste code No.

16 05 04\*

### Name of waste

gases in pressure containers (including halons) 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.

## 14. Transport information

### Land and inland navigation transport ADR/RID

UN 1012 1-BUTYLENE, 2.1, (B/D), Classification code: 2F

### Marine transport IMDG

UN 1012 BUTYLENE, 2.1

Ems: F-D, S-U

### Air transport ICAO/IATA-

DGR UN 1012 Butylene, 2.1

Cargo aircraft only.



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C<sub>4</sub>H<sub>8</sub>**! 15. Regulatory information****! Other regulations (EU)**

Please note:

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

**VOC standard**

**VOC content** >=99 % 20 °C 2545 hPa

**Chemical Safety Assessment**

For this substance a chemical safety assessment is not required because it is not classified regarding health and environmental hazards.

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

**16. Other information****Recommend 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.

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

R 12 Extremely flammable.

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.