Isobutylene

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Name of product	Isobutylene Art-Nr(n).: 2420
Name of substance	2-methylpropene
Index No	601-012-00-4
EC No	204-066-3
REACH registration number	01-2119456616-32
CAS No	115-11-7

Manufacturer / Distributor:

Ehsan International Gases
40/9, Aurangabad, Nazimabad
#3, Karachi 74600, Pakistan.
+92 21 36612091 – 36612907
info@ehsan.com.pk
www.ehsan.com.pk

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

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 - Calendering operations.
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at nondedicated facilities.
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing).
PROC14 - Production of preparations or articles by tabletting, 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.

Isobutylene

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]

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.

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

Results of PBT and vPvB assessment

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

SECTION 3: Composition/ information on ingredients

3.1. Substances

CAS No 115-11-7
2-methylpropene
EC No 204-066-3
Index No 601-012-00-4
REACH registration number 01-2119456616-32

3.2. Mixtures
not applicable

SECTION 4: 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 artifical 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 minuts. 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
Physician's information / possible symptoms
The following symptoms may occur in case of strong exposition:
Anaesthetic state

4.3. Indication of any immediate medical attention and special treatment needed
Treatment (Advice to doctor) Treat symptoms.
Monitor circulation.

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media
Foam
Dry powder
Carbon dioxide
Water spray jet

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.
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
For non-emergency personnel See chapter 8.
Evacuate area.
Eliminate all ignition sources if safe to do so.
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.
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
Informations for safe handling see chapter 7.
Informations for personal protective equipment see chapter 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.
Containers' temperature may not be increased above 50 °C.
Do not heat with open flames.
The working pressure in the receptacle must not exceed the saturation vapour pressure of the pure product resulting at a temperature of 50 °C.
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.
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.

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. Keep container in a well-ventilated place
Protect of heat.
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, 8 h): 769 mg / m³ (335 ppm), long-term (repeated uptake) - systemic effects (toxicity).
DNEL (workers, inhalation, 8 h): 1530 mg/m³ (667 ppm), long-term (repeated uptake) - local effects (toxicity).

8.2. Exposure controls

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

Eye protection safety goggles, in case of increased risk add
protective face shield

Other protection measures

Safety shoes with steel toe.
Body covering work clothing, or chemical resistant suit at increased risk.

Limitation and surveillance of the environment

PNEC: not required, because the substance is gaseous.
See chapter 7.

Appropriate engineering controls

Transfer and handle only in enclosed systems.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance **Colour** Gaseous / liquefied under pressure. **Odour**
colourless sweetish

Odour threshold

No information available.

Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value	not applicable				
Acid number	not applicable				
boiling point	-6,9 °C		1013 hPa		
melting point	-140 °C				
Flash point	< -80 °C			DIN 51755	
Vapourisation rate	No information available.				
Flammable (solid)	not applicable				
Flammability (gas)					Flammable.
Ignition temperature	465 °C			DIN 51794	

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	Value	Temperature	at	Method	Remark
Self ignition temperature	No information available.				
Lower explosion limit	1,6 Vol-%				
Upper explosion limit	10 Vol-%				
Vapour pressure	2560 hPa	20 °C			
Relative density	0,594 g/cm3	20 °C			liquid phase
Vapour density	1,94				
Solubility in water	0,263 g/l	20 °C			
Solubility/other					soluble in organic solvent
Partition coefficient noctanol/water (log P O/W)	2,34				
Decomposition temperature	No information available.				
Viscosity	No information available.				

Oxidising properties
no

Explosive properties
No information available.

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
May react violently with oxidants. Risk of polymerisation.

10.4. Conditions to avoid Formation of explosive gas/air mixtures.

Heat sources / heat - risk of bursting.
Sources of ignition.

10.5. Incompatible materials

Materials to avoid Oxidants.

10.6. Hazardous decomposition products

No hazardous decomposition products known.

Thermal decomposition

Remark	No decomposition if used as directed.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity/Irritability/Sensitization

	Value/Validation	Species	Method	Remark
LC50 acute inhalation	> 10000 ppm (4 h)	rat (male / female)	OECD 403	
Irritability skin	non-irritant			
Irritability eye	non-irritant			
Skin sensitization	non-sensitizing			
Sensitization respiratory system	Not known.			

Subacute Toxicity - Carcinogenicity

	Value	Species	Method	Validation
Subchronic Toxicity	NOAEL > 18,4 mg/l (28 d) Inhalation	Rat (male / female)	OECD	
Chronic Toxicity	NOAEL 4,59 mg/l (2 a) Inhalation	Rat (male / female)	OECD 453	
Mutagenicity				No experimental information on genotoxicity in vitro and in vivo available.

Reproduction-Toxicity	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.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicological effects

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

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 degradability		QSAR	readily degradable

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

12.4. Mobility in soil
Adsorption in the soil is not likely.

12.5. Results of PBT and vPvB assessment
This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

12.6. Other adverse effects
Not known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste code No.	**Name of waste**
16 05 04*	gases in pressure containers (including halons) containing dangerous substances

Wastes marked with an asterisk are considered to be hazardous waste pursuant to Directive 2008/98/EC 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

	ADR/RID	IMDG	IATA-DGR
14.1. UN number	1055	1055	1055
14.2. UN proper shipping name	ISOBUTYLENE	ISOBUTYLENE	Isobutylene
14.3. Transport hazard class(es)	2	2.1	2.1
14.4. Packing group	-	-	-
14.5. Environmental hazards	No	No	No

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

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
No transport as bulk according IBC - Code.

Land and inland navigation transport ADR/RID
Hazard label(s) 2.1 tunnel restriction code B/D
Classification code 2F

Marine transport IMDG
Ems: F-D, S-U

Air transport ICAO/IATA-DGR
Cargo aircraft only.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
Other regulations (EU) Please note:
Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex XVII No 40.
Directive 96/82/EC on the control of major-accident hazards involving dangerous substances.

VOC standard
VOC content >=99 % 20 °C 2560 hPa

15.2. 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.

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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. Previous version: 7.0