

Global Product Strategy (GPS) Safety Summary

Isobutylene

This GPS Safety Summary is a high-level summary intended to provide the general public with an overview of product safety information on this chemical substance. It is not intended to provide emergency response, medical or treatment information, nor to provide an overview of all safety and health information. This summary is not intended to replace the Safety Data Sheet. For detailed guidance on the use or regulatory status of this substance, please consult the Safety Data Sheet and the Product Stewardship Bulletin (PSB).

Chemical Identity

Name: Isobutylene

Brand names: Isobutene, Isobutylene, Methylpropene, 2-Methylpropylene, 2-Methylprop-1-ene

Chemical name (IUPAC): 2-Methylpropene

CAS number: 115-11-7

EC number: 204-066-3

Molecular formula: C₄H₈

Uses and Applications

Isobutylene is used as a monomer for the production of various polymers such as butyl rubber, polybutene and polyisobutylene. The most important application of butyl rubber is the manufacture of tyres for cars and other vehicles. Other applications of butyl rubber, polybutene and polyisobutylene are lubricants (motor oils), adhesives, sealants and coatings.

Another major use of isobutylene is the production of methyl-tert-butyl ether (MTBE) and ethyl-tert-butyl ether (ETBE) which are gasoline blending components for cleaner burning fuels.

Isobutylene is also used for the production of anti-oxidants, fragrances and gas odorization products.

Physical / Chemical Properties

At ambient temperature and pressure, isobutylene is a colorless gas with a slight sweet odor. This gas can be liquefied under pressure. The substance has low solubility in water. It is non-explosive; however, it forms explosive mixtures with air. Containers holding isobutylene under pressure may explode if heated.

The boiling point and freezing point of isobutylene are -6.9°C (19.6°F) and -141°C (-221°F), respectively. Isobutylene is extremely flammable. It is stable under recommended storage conditions and no decomposition may occur if stored and applied as directed.

Isobutylene has been classified as hazardous under the Globally Harmonized System (GHS).

for its extreme flammability.

Health Effects

The most likely route of exposure is inhalation, as isobutylene is a gas at standard temperature and pressure.

The table below gives an overview of the health effects assessment results for isobutylene.

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Low acute inhalation toxicity. High vapor concentrations may produce narcosis or cause asphyxia by reducing the available concentration of oxygen
Irritation / corrosion Skin / eye/ respiratory tract	No known irritation from exposure to gas. Contact with evaporating liquid may cause frostbite
Sensitization	No known sensitization from exposure to gas
Toxicity after repeated exposure Oral / inhalation / dermal	Low concern for repeated exposure toxicity. High exposures may produce nasal effect
Genotoxicity / Mutagenicity	Not mutagenic/genotoxic
Carcinogenicity	Low cancer concern. Produced tumors in animals that may have been spurious and are of no or questionable relevance to humans
Toxicity for reproduction	Not toxic to reproduction or development

Environmental Effects

When released into the environment, isobutylene will volatilize rapidly. Therefore, water contamination and aquatic toxicity are not expected.

The table below gives an overview of the environmental assessment results for isobutylene.

Effect Assessment	Result
Aquatic Toxicity	Not expected to be toxic to the aquatic life, due to low exposure (although predicted harmful to aquatic life in case of significant acute exposure)

Fate and behaviour	Result
Biodegradation	This substance is expected to be rapidly biodegradable
Bioaccumulation potential	This substance is considered unlikely to bioaccumulate
PBT / vPvB conclusion	Not considered to be either PBT nor vPvB

PBT = Persistent, Bio-accumulative and Toxic in the environment.

vPvB = very Persistent and very Bio-accumulative in the environment.

Exposure

Human health

Exposure to isobutylene of personnel in manufacturing facilities is considered very low because the process, storage and handling operations are usually enclosed. However, worker exposure can potentially happen during operations like product transfer operations, product sampling, or maintenance/repair activities on product containing systems. The risk of accidental exposure should be controlled and mitigated by selecting and applying the appropriate Risk Management Measures.

Environment

Isobutylene is manufactured in a closed and automated process. Transfer operations (such as loading and transport) are realized with dedicated equipment and under recommended Safe Use guidance to reduce the risk of release to the environment.

Risk Management Measures

For detailed guidance on the use of isobutylene, the Safety Data Sheet and the Product Stewardship Bulletin should be consulted.

Isobutylene should only be handled by knowledgeable and trained personnel.

Flammability

Because of its flammability potential, isobutylene should not be handled or stored near heat, sparks or flame.

Metal containers involved in the handling and storage of this material should be grounded and bonded.

Vapor space above stored liquid may be flammable unless blanketed with inert gas.

Human health

When using chemicals make sure that there is adequate ventilation. Always use appropriate chemical-resistant gloves to protect your hands and skin, always wear eye protection, such as chemical goggles, and always wear flame-retardant clothing. Do not eat, drink, or smoke where chemicals are handled, processed, or stored. Wash hands and skin following contact. If the substance gets into your eyes, rinse eyes thoroughly for at least 15 minutes with tap water and seek medical attention.

In the case of transfer or maintenance operations, always clear transfer lines prior to decoupling, and flush/drain to a closed system for recycle prior to opening equipment.

In cases where engineering controls cannot maintain airborne substance concentrations below exposure limits, or in cases with a risk of accidental exposure, additional risk management measures may be necessary for safe use, such as the use of a complete suit protecting against chemicals and supplied air, a self-contained breathing apparatus or respirator.

Environmental

In case of accidental release or spill, do not allow the product to enter sewers, surface or ground water.

Regulatory Information / Classification and Labeling

This substance has been registered under REACH by relevant companies of LyondellBasell in the European Union.

For a detailed overview of the regulatory status of this substance, please refer to the Product Stewardship Bulletin which is available from the LyondellBasell corporate website.

Under GHS (Globally Harmonized System on Classification and Labeling) substances are classified according to their physical, health and environmental hazards. The hazards are communicated via specific labels on the product packaging and the Safety Data Sheet. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use.

For a detailed overview of the classification and labeling of this substance, please refer to the regional Safety Data Sheet, which can be found on the LyondellBasell corporate website.

Conclusion Statements

- Isobutylene is used to manufacture a wide range of products such as tyres, lubricants, sealants and adhesives, anti-oxidants and fragrances. It also used to produce gasoline blending components for cleaner burning fuels.
- Isobutylene has been classified as hazardous. It is extremely flammable and forms explosive mixtures with air.
- Isobutylene can cause CNS (central nervous system) depression and is considered as a simple asphyxiant at elevated concentrations.
- Exposure risk to humans and the environment is considered very low as Isobutylene manufacturing process, storage and handling operations are enclosed.

Contact Information within Company

For further information on this product in general, please consult the LyondellBasell corporate website (www.lyb.com).

Date of issue

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Isobutylene is a product of Lyondell Chemical Company and Lyondell Chemie Nederland B.V.