Chemical Safety Data Sheet MSDS / SDS

Isobutane SDS

Revision Date:2024-04-25 Revision Number:1

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

Product identifier

Product name: Isobutane

CAS: 75-28-5

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

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

Company Identification

Company: Chemicalbook.in

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SECTION 2: Hazards identification

Classification of the substance or mixture

Gases under pressure: Compressed gas
Flammable gases, Category 1A, Flammable gas

Germ cell mutagenicity, Category 1B
Carcinogenicity, Category 1A

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H220 Extremely flammable gas
H340 May cause genetic defects
H350 May cause cancer

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P203 Obtain, read and follow all safety instructions before use.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

Response

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 In case of leakage, eliminate all ignition sources.
P318 IF exposed or concerned, get medical advice.

Storage

P410+P403 Protect from sunlight. Store in a well-ventilated place.
P403 Store in a well-ventilated place.
P405 Store locked up.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	Isobutane
Common names and synonyms:	Isobutane
CAS number:	75-28-5
EC number:	200-857-2
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention .

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

Most important symptoms/effects, acute and delayed

Central nervous system depression ranging from dizziness and incoordination to anesthesia and respiratory arrest, depending on concentration and extent of inhalation. Irregular heartbeat is rare but is a dangerous complication at anesthetic levels. (USCG, 1999)

Indication of immediate medical attention and special treatment needed, if necessary

INHALATION: Fresh air, rest. Refer for medical attention. Half-upright position. Artificial respiration may be needed. Refer for medical attention. SKIN: ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention. EYES: First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.

SECTION 5: Firefighting measures

Suitable extinguishing media

Butane is a flammable gas. In case of fire, stop the flow of gas if it can be done safely. Use dry chemical, carbon dioxide, or halon extinguishers. Use water to keep fire-exposed containers cool and to protect personnel doing the shut-off. If leak or spill has caught fire, use water spray to disperse gas and to protect personnel shutting off leak. If cooling streams are ineffective (venting sound increases in volume and pitch, tank discolors, or shows any signs of deforming), withdraw immediately to a secure position. If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters. Contact your Department of Environmental Protection or your regional office of the federal EPA for specific recommendations. If employees are required to fight fires, they must be properly trained and equipped. OSHA 1910.156. Butanes

Specific hazards arising from the chemical

Excerpt from ERG Guide 115 [Gases - Flammable (Including Refrigerated Liquids)]: EXTREMELY FLAMMABLE. Will be easily ignited by heat, sparks or flames. Will form explosive mixtures with air. Vapors from liquefied gas are initially heavier than air and spread along ground. CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966) and Methane (UN1971) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.) Vapors may travel to source of ignition and flash back. Cylinders exposed to fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket. (ERG, 2016)

Special protective actions for fire-fighters

Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out. In other cases extinguish with water spray. In case of fire: keep cylinder cool by spraying with water. Combat fire from a sheltered position.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Ventilation. Remove all ignition sources. NEVER direct water jet on liquid. Personal protection: filter respirator for organic vapours of low boiling point adapted to the airborne concentration of the substance.

Environmental precautions

Evacuate danger area! Consult an expert! Ventilation. Remove all ignition sources. NEVER direct water jet on liquid. Personal protection: filter respirator for organic vapours of low boiling point adapted to the airborne concentration of the substance.

Methods and materials for containment and cleaning up

Evacuate and restrict persons not wearing protective equipment from area of spill or leak until cleanup is complete. Remove all ignition sources. Keep the gas concentration below the explosive limit range by forced ventilation. Stop the flow of gas. If source of leak is a cylinder and the leak cannot be stopped in place, remove leaking cylinder to a safe place in the open air, and repair leak or allow cylinder to dissipate to the atmosphere. If employees are required to clean up spills, they must be properly trained and equipped. OSHA 1910.120(q) may be applicable. Butanes

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding) if in liquid state. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Fireproof. Cool.Store in tightly closed containers in a cool, well-ventilated area away from incompatible materials ... and heat. Butanes

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 1000 ppm as STEL.MAK: 2400 mg/m3, 1000 ppm; peak limitation category: II(4); pregnancy risk group: D

Biological limit values

no data available

Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety goggles or face shield.

Skin protection

Cold-insulating gloves. Protective clothing.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Isobutane is a colorless gas with a faint petroleum-like odor. It is shipped as a liquefied gas under its vapor pressure. Contact with the liquid can cause frostbite. It is easily ignited. The vapors are heavier than air. Any leak can either be liquid or vapor. It can asphyxiate by the displacement of air. Under prolonged exposure to fire or intense heat the containers may rupture violently and rocket.
Colour:	Colorless gas [Note: Shipped as a liquified compressed gas. A liquid below 11deg F]
Odour:	Gasoline-like or natural gas odor.
Melting point/freezing point:	-160°C(lit.)
Boiling point or initial boiling point and boiling range:	?12°C(lit.)
Flammability:	Flammable Gas

Lower and upper explosion limit/flammability limit:	Lower flammable limit: 1.8% by volume; Upper flammable limit: 8.4% by volume
Flash point:	-83°C
Auto-ignition temperature:	860°F
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	0.238 cP at -10 deg C
Solubility:	Slight (NIOSH, 2016)
Partition coefficient n-octanol/water:	log Kow = 2.76
Vapour pressure:	72.2 psi (37.7 °C)
Density and/or relative density:	2.064g/mLat 25°C(lit.)
Relative vapour density:	2.01 (21 °C, vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Reacts with strong oxidants, acetylene, halogens and nitrogen oxides. This generates fire and explosion hazard.

Chemical stability

no data available

Possibility of hazardous reactions

SEVERE, WHEN EXPOSED TO HEAT OR FLAME. The gas is heavier than air and may travel along the ground; distant ignition possible. As a result of flow, agitation, etc., electrostatic charges can be generated. ISOBUTANE is incompatible with the following: Strong oxidizers (e.g., nitrates & perchlorates), chlorine, fluorine, (nickel carbonyl + oxygen) (NIOSH, 2016).

Conditions to avoid

no data available

Incompatible materials

Reacts with strong oxidants, acetylene, halogens and nitrogen oxides causing fire and explosion hazard.

Hazardous decomposition products

no data available

SECTION 11: Toxicological information

Acute toxicity

Oral: no data available

Inhalation: LC50 Rat inhalation (15 min) 570000 ppm

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

Rapid evaporation of the liquid may cause frostbite. The substance may cause effects on the cardiovascular system. This may result in impaired functions and respiratory failure. Exposure at high levels could cause death.

STOT-repeated exposure

no data available

Aspiration hazard

A harmful concentration of this gas in the air will be reached very quickly on loss of containment.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

AEROBIC: Indigenous soil microorganisms will biodegrade petroleum products under aerobic conditions(1). Biodegradation may occur under anaerobic conditions at a much slower rate, particularly by sulfur-reducing bacteria(2). It was demonstrated that isobutane is oxidized by bacteria as the sole source of carbon and energy(1). The bacteria were isolated from lake water and soil near a refinery in New Jersey. In the case of a Brevibacterium sp., the rate of oxidation of isobutane was about 70% that of n-

butane. However, no isobutane degraded in 8 days when incubated with groundwater contaminated with gasoline(3). Isobutane was subject to biodegradation in a microcosm designed to simulate conditions in Narragansett Bay, RI in September and November(4). The biodegradation half-lives for isobutane were 16-26 days for September (20 deg C) and 33-139 days for November (10 deg C)(4). The degradation rate was slower than for n-butane and fell between that of propane and ethane. The biodegradation increased markedly on acclimation. Approximately 95% of the isobutane present in the microcosm after 12.9 days degraded within the next 2 days(1).

Bioaccumulative potential

An estimated BCF of 27 was calculated for isobutane(SRC), using a log Kow of 2.76(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

Mobility in soil

Using an estimation method based on molecular connectivity indices(1), the Koc for isobutane is estimated to be 35(SRC). According to a suggested classification scheme(2), this Koc value suggests that isobutane will have very high mobility in soil(SRC).

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: UN1969 (For reference only, please check.)
IMDG: UN1969 (For reference only, please check.)
IATA: UN1969 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: ISOBUTANE (For reference only, please check.)
IMDG: ISOBUTANE (For reference only, please check.)
IATA: ISOBUTANE (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 2.1 (For reference only, please check.)
IMDG: 2.1 (For reference only, please check.)
IATA: 2.1 (For reference only, please check.)

Packing group, if applicable

ADR/RID: (For reference only, please check.)
IMDG: (For reference only, please check.)
IATA: (For reference only, please check.)

Environmental hazards

ADR/RID: No
IMDG: No
IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home

HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm

IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple

ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg

Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp

ECHA - European Chemicals Agency, website: https://echa.europa.eu/

Other Information

Turn leaking cylinder with the leak up to prevent escape of gas in liquid state.The measures mentioned in section PREVENTION are applicable to production, filling of cylinders, and storage of the gas.