

## Chemical Safety Data Sheet MSDS / SDS

## Isobutyraldehyde SDS

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

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

Product name: Isobutyraldehyde

CAS: 78-84-2

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

Relevant identified uses: For R&amp;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**

Flammable liquids, Category 2

Eye irritation, Category 2

## GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

### Hazard statement(s)

H225 Highly flammable liquid and vapour

H319 Causes serious eye irritation

### Precautionary statement(s)

#### Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233 Keep container tightly closed.

P240 Ground and bond container and receiving equipment.

P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.

P242 Use non-sparking tools.

P243 Take action to prevent static discharges.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

P264 Wash ... thoroughly after handling.

#### Response

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].

P370+P378 In case of fire: Use ... to extinguish.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue rinsing.

#### Storage

P403+P235 Store in a well-ventilated place. Keep cool.

#### 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:	Isobutyraldehyde
Common names and synonyms:	Isobutyraldehyde
CAS number:	78-84-2
EC number:	201-149-6
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

Rinse skin with plenty of water or shower. Remove contaminated 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. Do NOT induce vomiting. Give one or two glasses of water to drink. Refer for medical attention .

#### Most important symptoms/effects, acute and delayed

Vapor is irritating to the eyes and mucous membranes. (USCG, 1999)

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

Basic treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Aggressive airway management may be necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Anticipate seizures and treat if necessary. Monitor for shock and treat if necessary. Monitor for pulmonary edema and treat if necessary. For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport. Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Administer activated charcoal. Aldehydes and related compounds

## SECTION 5: Firefighting measures

### Suitable extinguishing media

Foam, dry chemical or carbon dioxide.

### Specific hazards arising from the chemical

Behavior in Fire: Vapors are heavier than air and may travel considerable distance to a source of ignition and flash back. Fires are difficult to control due to ease of reignition. (USCG, 1999)

### Special protective actions for fire-fighters

Use powder, foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Remove all ignition sources. Personal protection: protective clothing, protective gloves, safety goggles and filter respirator for organic vapours of low boiling point adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Do NOT wash away into sewer. Collect leaking liquid in sealable containers. Cover the spilled material with inert absorbent. Then store and dispose of according to local regulations.

### Environmental precautions

Evacuate danger area! Consult an expert! Remove all ignition sources. Personal protection: protective clothing, protective gloves, safety goggles and filter respirator for organic vapours of low boiling point adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Do NOT wash away into sewer. Collect leaking liquid in sealable containers. Cover the spilled material with inert absorbent. Then store and dispose of according to local regulations.

### **Methods and materials for containment and cleaning up**

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

## **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. Do NOT use compressed air for filling, discharging, or handling. 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. Separated from strong oxidants, strong bases, strong acids and strong reducing agents. Well closed. Store in an area without drain or sewer access. MATERIALS WHICH ARE TOXIC AS STORED OR WHICH CAN DECOMPOSE INTO TOXIC COMPONENTS ... SHOULD BE STORED IN A COOL WELL VENTILATED PLACE, OUT OF THE DIRECT RAYS OF THE SUN, AWAY FROM AREAS OF HIGH FIRE HAZARD, AND SHOULD BE PERIODICALLY INSPECTED. INCOMPATIBLE MATERIALS SHOULD BE ISOLATED .

## **SECTION 8: Exposure controls/personal protection**

### **Control parameters**

### **Occupational Exposure limit values**

no data available

### **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 spectacles.

### Skin protection

Protective gloves.

### 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:	Liquid.
Colour:	Transparent, colorless.
Odour:	EXTREMELY SHARP
Melting point/freezing point:	-65.9 °C.
Boiling point or initial boiling point and boiling range:	64.4 °C. Atm. press.:1 013.25 hPa.
Flammability:	Highly flammable. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit:	% BY VOL; LOWER 1.6, UPPER 10.6
Flash point:	-24 °C. Atm. press.:1 013 hPa.
Auto-ignition temperature:	180 °C. Atm. press.:1 013.25 hPa.
Decomposition temperature:	no data available

pH:	no data available
Kinematic viscosity:	dynamic viscosity (in mPa s) = 0.43. Temperature:20°C.
Solubility:	Miscible with water
Partition coefficient n-octanol/water:	log Pow = 0.77. Temperature:25 °C. Remarks:PH value is not reported.
Vapour pressure:	230.65 hPa. Temperature:25 °C. Remarks:Reported value: 173 mm Hg at 25 °C.
Density and/or relative density:	0.78 g/cm <sup>3</sup> . Temperature:25.8 °C.
Relative vapour density:	2.5 (vs air)
Particle characteristics:	no data available

## SECTION 10: Stability and reactivity

### Reactivity

Decomposes on heating and on burning. This produces acrid smoke and fumes. Reacts with oxidants, strong reductants and strong bases.

### Chemical stability

Oxidises slowly on exposure to air, forming isobutyric acid.

### Possibility of hazardous reactions

A very dangerous fire hazard when exposed to heat, flame, or oxidizers. The vapour is heavier than air and may travel along the ground; distant ignition possible. ISOBUTYL ALDEHYDE can react vigorously with reducing agents, with oxidizing agents, strong bases and mineral acids. Can undergo exothermic self-condensation or polymerization reactions that are often catalyzed by acid. Generates flammable and/or toxic gases in combination with azo, diazo compounds, dithiocarbamates, nitrides, and strong reducing agents. Reacts slowly when exposed to air with air to give peroxides and other products. These reactions are activated by light, catalyzed by salts of transition metals, and are autocatalytic (catalyzed by their products). The addition of stabilizers (antioxidants) retards autoxidation.

**Conditions to avoid**

no data available

**Incompatible materials**

Can react vigorously with reducing materials.

**Hazardous decomposition products**

no data available

**SECTION 11: Toxicological information****Acute toxicity**

Oral: LD50 - rat (female) - 3 730 mg/kg bw.

Inhalation: LC50 - rat (female) - > 23.6 mg/L air.

Dermal: LD50 - rabbit (male) - ca. 7.13 mL/kg bw.

**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**

The substance is irritating to the eyes. The substance at very high concentrations is irritating to the upper respiratory tract. If swallowed the substance may cause vomiting and could result in aspiration pneumonitis. Medical observation is indicated. The substance may cause effects on nervous system. Exposure could cause lowering of consciousness.

### **STOT-repeated exposure**

Repeated or chronic inhalation of the vapour may cause chronic inflammation of the upper respiratory tract.

### **Aspiration hazard**

No indication can be given whether a harmful concentration in the air will be reached.

## **SECTION 12: Ecological information**

### **Toxicity**

Toxicity to fish: LC50 - *Pimephales promelas* - 23 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC50 - *Daphnia magna* - 277 mg/L - 48 h.

Toxicity to algae: EC50 - *Desmodesmus subspicatus* (previous name: *Scenedesmus subspicatus*) - 83.7 mg/L - 72 h.

Toxicity to microorganisms: NOEC - activated sludge - 100 mg/L - 14 d.

### **Persistence and degradability**

**AEROBIC:** Using a sewage inocula and standard dilution water, isobutyraldehyde had a 5-day theoretical BOD of 66%(2). Isobutyraldehyde was found to be readily biodegradable in a screening study using activated sludge (more specific data were not reported)(2). In an anaerobic screening study simulating a biological treatment plant (digester sludge inocula), isobutyraldehyde experienced a 71% removal at retention times of 144-240 hr(3). In a screening study simulating an anaerobic lagoon (digester sludge inocula), isobutyraldehyde experienced a 76% removal at retention times of 240-2400 hr(3). Using a Warburg respirometer, an activated sludge seed, and a 24-hr incubation period, isobutyraldehyde had a theoretical BOD of 24.3% at an initial concn of 500 ppm(4). Isobutyraldehyde, present at 100 mg/l, reached 81% of its theoretical BOD in 2 weeks using an activated sludge inoculum at 30 mg/l and the Japanese MITI test(5).

### **Bioaccumulative potential**

An estimated BCF of 1 was calculated for isobutyraldehyde(SRC), using a water solubility of 89,000 mg/l(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**

The Koc of isobutyraldehyde is estimated as 8(SRC), using a water solubility of  $8.9 \times 10^4$ (1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that isobutyraldehyde is expected to 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: UN2045 (For reference only, please check.)

IMDG: UN2045 (For reference only, please check.)

IATA: UN2045 (For reference only, please check.)

### **UN Proper Shipping Name**

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

#### **Transport hazard class(es)**

ADR/RID: 3 (For reference only, please check.)  
IMDG: 3 (For reference only, please check.)  
IATA: 3 (For reference only, please check.)

#### **Packing group, if applicable**

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

Rinse contaminated clothing with plenty of water because of fire hazard.

Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any