

GPS Safety Summary

This Product Safety Summary is intended to provide a brief overview of the information on the risk assessment results of the chemical product that we manufacture based on the chemical industry's Global Product Strategy (GPS) to the general public as a social responsibility of a company that manufacture chemical substances.

This summary is not intended to provide technical information including effects on human health and the environment and details of risk assessment. In addition, it is not intended to be prepared as a document to replace a Safety Data Sheet (SDS) or a risk assessment report like a Chemical Safety Report under the REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) (REACH CSR). Although the summary is prepared based on the laws, materials, information and data that are available at the present moment, it does not provide any assurances.

SUBSTANCE NAME

Isobutanol (2-methylpropan-1-ol, CAS No. 78-83-1)

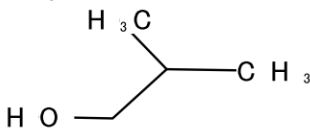
GENERAL STATEMENT

Isobutanol is a clear and colorless liquid with a specific odor. It is used as intermediate of industrial products such as synthetic raw material, material of polymer, initiator of polymerization.

Isobutanol causes skin irritation and serious eye damaging, and may cause respiratory irritation, drowsiness or dizziness and may be harmful if swallowed and enters airways. Isobutanol is biodegradable and low Bioaccumulative.

It is recommended to wear appropriate protective masks, gloves while sampling or transfer for manufacturing. It is also recommended to take effective measures to prevent leakage and conduct regular monitoring and maintenance and inspection of facilities to minimize the effect on environmental organism.

CHEMICAL IDENTITY

Item	Contents
Generic name	Isobutanol
Trade name	Isobutanol
Chemical name	Isobutanol (IUPAC name: 2-methylpropan-1-ol)
CAS No.	78-83-1
Other numbers	Reference No. listed in the official gazettes (Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., Industrial Safety and Health Act) (2)-3049 EC No. 201-148-0
Molecular formula	C ₄ H ₁₀ O
Structural formula	
Other information	None in particular

USES AND APPLICATIONS

Intended uses of our product As a intermediate of industrial products (synthetic raw material, material of polymer, initiator of polymerization)

PHYSICAL/CHEMICAL PROPERTIES

Appearance (physical state)	Liquid
Color	Clear and colorless
Odor	None
Specific gravity (relative density)	No information
Melting point/boiling point	- 108°C/ 108°C
Combustibility/flammability	Flammable liquid (Category 3)
Flash point	28°C
Limit of combustion or explosion	10.9 vol %/ 1.7 vol %
Auto ignition temperature	415°C
Vapor pressure	1200Pa(20°C)
Molecular weight	74.12
Water solubility	85g/L (25°C)
Octanol-water partition coefficient	LogKow: 0.83

HEALTH EFFECTS

Effect assessment	Results (GHS ^{*1} hazard classification)
Acute toxicity (oral ingestion)	Not classified ^{*2}
Acute toxicity (inhalation)	Not applicable ^{*3} (gas) Not classified (vapor) Classification not possible ^{*4} (dust/mist)
Acute toxicity (dermal)	Not classified
Skin corrosion/irritation	Causes skin irritation (Category 2)
Serious eye damage/eye irritation	Causes serious eye irritation (Category 2A)
Respiratory sensitization	Classification not possible
Skin sensitization	Classification not possible
Germ cell mutagenicity	Not classified
Carcinogenicity	Classification not possible
Reproductive toxicity	Classification not possible
Specific target organ toxicity (Single exposure)	May cause respiratory irritation (Category 3), may cause drowsiness or dizziness (Category 3)
Specific target organ toxicity (Repeated exposure)	Not classified
Aspiration hazard	May be harmful if swallowed and enters airways (Category 2)
Source/remarks	

^{*1} GHS: Globally Harmonized System of Classification and Labelling of Chemicals. This system enables us to classify chemicals by hazard type and degree according to globally harmonized rules.

^{*2} Not classified: Hazardousness much lower than the lowest hazard class specified by GHS

^{*3} Not applicable: Because the physical properties defined by GHS are not met, the chemical is not included in the target chemicals of the classification.

*4 Classification not possible: The data needed for judging classification are not available at all or sufficient data are not collected for classification.

ENVIRONMENTAL EFFECTS

Effect assessment	Results (GHS hazard classification)
Hazardous to the aquatic environment (acute)	Not classified
Hazardous to the aquatic environment (chronic)	Not classified
Environmental fate/dynamics	Results
Transfer in the environment	Low volatility from water and low soil absorption
Biodegradability	Readily biodegradable
Bioaccumulation	Low bioaccumulative potential
Conclusion of PBT/vPvB	Not judged to be PBT* and vPvB**.
	*PBT: Persistent, bioaccumulative and toxic (Remaining in the environment and having high bioaccumulative and strong toxic properties)
	**vPvB: very Persistent and very Bioaccumulative (Readily remaining in the environment and having very high bioaccumulative property)

EXPOSURE

Details	No.	Potential exposure in the process of use of our products (exposure route)
Occupational exposure	1-1	In the operation of manufacture or use, there is potential for worker exposure via skin or inhalation during the work of closed and continuous process at the time of maintenance, sampling, trouble of plant or so on, exist. There is also potential for worker exposure via skin or inhalation in the process such as no special facility, transfer to ship or large capacity of container of substance or mixture.
Consumer exposure	2-1	This material is not used by consumers and therefore the potential for consumer exposure is extremely low.
Environmental Exposure	3-1	There is potential for environmental exposure in the process of manufacturing of the substance, mixing for mixture or using as intermediate for other substance. In the occasion of using as processing agent which does not become a part of article such as solvent for painting, it is easy to release into air or environment. There is also potential for release into soil. However isobutanol is manufactured in a closed system process, the possibility of environment release is very low. Because it is liquid at normal temperature and normal pressure, in the case of environmental release, it disperses in water system. It is expected to be degraded in the water system relatively rapidly.
Note		If there is the potential for exposure in the other uses, take appropriate measures in reference to the risk management recommends.

RISK MANAGEMENT RECOMMENDATIONS

Details	No.	Management recommendations based on our risk assessment results
Occupational	1-1	Wear appropriate protective masks, clothing and gloves made of

exposure		materials that isobutanol does not penetrate during sampling operation or transfer. The American Conference of Governmental Industrial Hygienists (ACGIH) and Japan Society of Occupational Health set the threshold limit value of ethylene glycol in the work environment at 50ppm(150mg/m ³) and recommend that the concentration in the place of manufacturing or use should be controlled and regulated to levels below this environmental concentration. The operation manager instructs workers how to select and use the appropriate protective equipment and how to manage the work place.
Consumer exposure	2-1	None
Environmental Exposure	3-1	Install exhaust-gas and sewage treatment equipment and take effective measures to prevent leakage. Take care of regular confirmation of discharge volume, daily maintenance and handling.
Other warnings Note		None For the measures and actions to be taken for regular handling, emergency situations, disposal and transportation, see Section 4, 5, 6, 7, 8, 13 and 14, SDS issued by Mitsubishi Chemical Corporation.

STATE AGENCY REVIEW

Assessment document	Review condition
OECD HPV	http://www.chem.unep.ch/irptc/sids/OECDSEIDS/78831.pdf
National Institute of Evaluation and Technology (NITE)	None
- Preliminary Risk Assessment of Chemical Substances	
Ministry of Environment	None
- Preliminary Environment Risk Assessment of Chemical Substances	
REACH	http://apps.echa.europa.eu/registered/registered-sub.aspx

REGULATORY INFORMATION / LABELLING INFORMATION

Main regulatory information

Law	Regulatory condition
UN class	3
UN No.	1212
Fire Service Act	Not applicable
Ship Safety Act	Hazardous Substance List, Separate Table 1 Flammable Liquids
Poisonous and Deleterious Substances Control Act	Not applicable
Act on the Evaluation of Chemical Substances and Regulation of Their	Not applicable

<p>Manufacture, etc. Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof Civil Aeronautics Act Other Law</p>	<p>Not applicable</p> <p>Substances Approved for Transportation, 3. Flammable Liquids Act on Port Regulations: Ordinance for Enforcement Article 12, Hazardous Substance List, Flammable Liquids Act for the Prevention of Marine Pollution and Maritime Disaster: Ordinance for Enforcement Article 12, Hazardous Substance List, Flammable Liquids Act for the Prevention of Marine Pollution and Maritime Disasters: Marine Pollutants in the case of Bulk Transportation (Class Z) Offensive Odor Control Law: Offensive odor substances</p>
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Labelling information

Pictograms or symbols



Signal Word

Hazard statement

Warning

- Flammable liquid and vapor
- Causes skin irritation
- Causes serious eye irritation
- May cause respiratory irritation
- May cause drowsiness or dizziness
- May be harmful if swallowed and enters airways

CONTACT INFORMATION WITHIN COMPANY

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