

Material Safety Data Sheet

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Version 1.4

According to 91/155/EEC

1 - Product and Company Information

Product Name	ISOBUTANOL, ACS
Product Number	58450
Company	Sigma-Aldrich Pte Ltd #08-01 Citilink Warehouse Singapore 118529 Singapore
Technical Phone #	65 271 1089
Fax	65 271 1571

2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
2-METHYL-1-PROPANOL	78-83-1	201-148-0	603-108-00-1

Formula	C4H10O
Molecular Weight	74.12 AMU
Synonyms	Alcool isobutylique (French) * Fermentation butyl alcohol * 1-Hydroxymethylpropane * Isobutanol * Isobutyl alcohol (ACGIH:OSHA) * Isobutylalkohol (Czech) * Isopropylcarbinol * 2-Methyl propanol * 2-Methyl-1-propanol * 2-Methylpropan-1-ol * 2-Methylpropyl alcohol * 1-Propanol, 2-methyl- * RCRA waste number U140

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

Flammable. Irritating to respiratory system and skin. Risk of serious damage to eyes. Vapors may cause drowsiness and dizziness.

4 - First Aid Measures

AFTER INHALATION

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

AFTER SKIN CONTACT

In case of contact, immediately wash skin with soap and copious amounts of water.

AFTER EYE CONTACT

In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

AFTER INGESTION

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA

Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

Unsuitable: Water may be effective for cooling, but may not effect extinguishment.

SPECIAL RISKS

Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.

Explosion Hazards: Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area. Shut off all sources of ignition.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

ENVIRONMENTAL PRECAUTION(S)

Do not allow material to enter drains or water courses. Avoid contaminating water supply.

METHODS FOR CLEANING UP

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep container closed. Keep away from heat, sparks, and open flame.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling. Wash contaminated clothing before reuse.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	100 MG/M3

Poland		NDSch	200 MG/M3
Poland	ACGIH	TWA	-
			50 ppm
USA	OSHA.	TWA	50 ppm

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	150 mg/m3
		50 ppm

Remarks: LH

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	300 mg/m3
		100 ppm

Remarks: 4

Remarks: Y

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	75 mg/m3
		25 ppm

Remarks: T

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	154 mg/m3
		50 ppm
OEL	STEL	231 mg/m3
		75 ppm

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.

Hand Protection: Compatible chemical-resistant gloves.

Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance	Color: Colorless
	Form: Clear liquid

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	108 °C	760 mmHg
MP/MP Range	-108 °C	
Flash Point	28 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	427 °C	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	Lower: 1.7 %	
	Upper: 10.6 %	
Vapor Pressure	8 mmHg	20 °C
SG/Density	0.801 g/cm3	
Partition Coefficient	N/A	
Viscosity	4 Pas	20 °C
Vapor Density	2.55 g/l	
Saturated Vapor Conc.	N/A	
Evaporation Rate	0.6	
Bulk Density	N/A	
Decomposition Temp.	N/A	

Solvent Content	N/A
Water Content	< 0.1 %
Surface Tension	N/A
Conductivity	N/A
Miscellaneous Data	N/A
Solubility	N/A

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents, Acid chlorides, Acid anhydrides.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: NP9625000

ACUTE TOXICITY

LD50

Oral

Rat

*

LD50

Oral

Mouse

*

LC50

Inhalation

Rat

8,000 ppm

4 HR.

LD50

Skin

Guinea pig

> 1,000 mg/kg

ML/KG FOR SKIN UNITS

LD50

Skin

Rabbit

4,240 mg/kg

ML/KG FOR SKIN UNITS

LD50

Oral

Rat

2460 mg/kg

LD50

Intraperitoneal

Rat

720 MG/KG

LD50

Intravenous

Rat

340 MG/KG

LD50

Intraperitoneal

Mouse

544 MG/KG

Remarks: Liver:Other changes.

LD50

Intravenous

Mouse

417 MG/KG

LD50

Skin

Rabbit

3400 mg/kg

LD50

Intraperitoneal

Rabbit

323 MG/KG

LD50

Intraperitoneal

Guinea pig

1201 MG/KG

LD50

Intraperitoneal

Hamster

1401 MG/KG

IRRITATION DATA

Skin

Guinea pig

Remarks: Mild irritation effect

Eyes

Rabbit

Remarks: Moderate irritation effect

SENSITIZATION

Sensitization: Causes dermatitis.

SIGNS AND SYMPTOMS OF EXPOSURE

Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Can cause CNS depression. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes severe eye irritation.

Inhalation: May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.

Ingestion: May be harmful if swallowed.

TARGET ORGAN INFORMATION

Central nervous system. Liver. Kidneys.

CHRONIC EXPOSURE - CARCINOGEN

Species: Rat
Route of Application: Oral
Exposure Time: 90 DAYS
Frequency: 1 / day

Rat
Route of Application: Oral
Exposure Time: 71W
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS
criteria. Skin and Appendages: Other: Tumors. Blood: Leukemia

Rat
Route of Application: Subcutaneous
Exposure Time: 78W
Result: Tumorigenic: Carcinogenic by RTECS criteria.
Gastrointestinal: Tumors. Liver: Tumors.

12 - Ecological Information

No data available.

ECOTOXICOLOGICAL EFFECTS

Test Type: LC50 Fish
Species: Daphnia
Time: 96 h
Value: 1,220 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 48 h
Value: 1,520 - 1,750 mg/l

ADDITIONAL ECOLOGICAL INFORMATION

BOD5: 1.7 %
COD: 2.6 %

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

UN#: 1212
Class: 3
PG: III
Proper Shipping Name: Isobutanol

IMDG

UN#: 1212
Class: 3
PG: III
Proper Shipping Name: Isobutanol
Marine Pollutant: No
Severe Marine Pollutant: No

IATA

UN#: 1212
Class: 3
PG: III
Proper Shipping Name: Isobutanol
Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 603-108-00-1

NOTA: 6

INDICATION OF DANGER: Xi

Irritant.

R-PHRASES: 10 37/38 41 67

Flammable. Irritating to respiratory system and skin. Risk of serious damage to eyes. Vapors may cause drowsiness and dizziness.

S-PHRASES: 7/9 13 26 37/39 46

Keep container tightly closed and in well-ventilated place. Keep away from food, drink, and animal feedingstuffs. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable gloves and eye/face protection. If swallowed, seek medical advice immediately and show this container or label.

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 1

SWITZERLAND

SWISS POISON CLASS: 4

NORWAY

Labelling for organic solvents where the package is 1liter or more.

YL-tall m3/l: 10666

YL-group: 5

Risk phrases: 20

Harmful by inhalation.

Safety phrases: 38 42 210

In case of insufficient ventilation, wear suitable respiratory equipment. During fumigation/spraying wear suitable respiratory equipment. Use compressed air- or fresh air line breathing apparatus in confined spaces.

16 - Other Information

WARRANTY

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. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.
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