



OCI Company Ltd.

(여Material Safety Data Sheet

MSDS

Iso-Butyl Alcohol

Section 1 - Chemical Product and Company Identification

TRADE NAMES : Iso-Butyl Alcohol

Recommended use : Laboratory chemicals, Testing, Research and Industrial use

Restriction of use : Not for use other than for non-drinking, testing, research and industrial purposes

Company Identification

Company : OCI Company Ltd.

Address : 94, Sogong-ro, Jung-gu, Seoul, KOREA

Tel No. : 82 - 2 - 727 - 9494

Section 2 - Hazards Identification

1) Hazard Classification

Flammable Liquids : 3

Skin Corrosion/irritation: Category 2

Serious Eye Damage/Eye Irritation: Category 1

Specific target organ toxicity - (single exposure): Category 3

2) Warning signal

Symbol



Signal word

Danger

Hazard statement

H226 Flammable liquid and vapour
H315 Causes skin irritation
H318 Causes serious eye damage
H335 May cause respiratory irritation
H336 May cause drowsiness or dizziness

Prevention precautionary statements

P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/shower
P332 + P313 - If skin irritation occurs: Get medical advice/ attention
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/ physician
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection

3) NFPA

Health Rating

2

Flammability Rating 3
Reactivity Rating 0

Section 3 - Composition, Information on Ingredients

COMPONENT: Isobutyl alcohol

CAS No.: 78-83-1

PERCENTAGE: 100%

Section 4 - First Aid Measures

General information: Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.

Ingestion: Call a physician or poison control center immediately. Do NOT induce vomiting.

Inhalation: Move to fresh air. Get medical attention if symptoms persist.

Skin contact: Wash with soap and water. If skin irritation occurs: Get medical advice/attention. Take off immediately all contaminated clothing. Wash contaminated clothing before reuse.

Eye contact: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Most important symptoms/effects, acute and delayed Symptoms: Irritating to eyes, respiratory system and skin. Causes serious eye damage. Narcotic effect. .

Indication of immediate medical attention and special treatment needed Treatment: Symptoms may be delayed. Treat symptomatically.

Section 5 - Fire Fighting Measures

General fire hazards: Flammable liquid and vapor.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Water spray, foam, dry powder or carbon dioxide.

Unsuitable extinguishing media: Avoid water in straight hose stream; will scatter and spread fire.

Specific hazards arising from the chemical: Vapors may cause a flash fire or ignite explosively. Vapors may travel considerable distance to a source of ignition and flash back. Prevent buildup of vapors or gases to explosive concentrations. Heat may cause the containers to explode.

Special protective equipment and precautions for firefighters

Special fire fighting procedures: Use water spray to keep fire-exposed containers cool. Water may be ineffective in fighting the fire. Fight fire from a protected location. Move containers from fire area if you can do so without risk.

Special protective equipment for fire-fighters: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

Section 6 - Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Keep unauthorized personnel away. Keep upwind. Use personal protective equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. See Section 8 of the MSDS for Personal Protective Equipment.

Methods and material for containment and cleaning up: Eliminate all ignition sources if safe to do so. Take

precautionary measures against static discharges. Stop leak if possible without any risk. Use only non-sparking tools. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. Dike far ahead of larger spill for later recovery and disposal.

Notification Procedures: Prevent entry into waterways, sewer, basements or confined areas. Inform authorities if large amounts are involved.

Environmental precautions: Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so.

Section 7 - Handling and Storage

Precautions for safe handling: DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Take precautionary measures against static discharges.

Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting/equipment. Use only non-sparking tools. Wear protective gloves/protective clothing/eye protection/face protection. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Wash hands thoroughly after handling.

Conditions for safe storage, including any incompatibilities: Keep away from food, drink and animal feeding stuffs. Keep container tightly closed in a cool, well-ventilated place. Ground container and transfer equipment to eliminate static electric sparks. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of flammable liquids.

Section 8 - Exposure Controls, Personal Protection

Control parameters

Occupational exposure limits

Chemical identity	Type	Exposure Limit values	Source
Isobutyl alcohol	TWA	50 ppm	US. ACGIH Threshold Limit Values (2011)
	REL	50 ppm 150 mg/m ³	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	PEL	100 ppm 300 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	TWA	50 ppm 150 mg/m ³	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)

Appropriate engineering controls No data available.

Individual protection measures, such as personal protective equipment

General information: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. An eye wash and safety shower must be available in the immediate work area. Use explosion-proof ventilation equipment.

Eye/face protection: Wear safety glasses with side shields (or goggles).

Skin protection

Hand protection: Chemical resistant gloves

Other: Wear suitable protective clothing.

Respiratory protection: In case of inadequate ventilation use suitable respirator.

Hygiene measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Provide eyewash station and safety shower.

Section 9 - Physical and Chemical Properties

Appearance

Physical state: Liquid

Form: Liquid

Color: Colorless

Odor: Sweet musty odor

Odor threshold: No data available

pH: No data available

Melting point/freezing point: -108 °C

Initial boiling point and boiling range: 108 °C

Flash Point: 28 °C

Evaporation rate: 0.82 (Butyl Acetate=1)

Flammability (solid, gas): Not applicable.

Upper/lower limit on flammability or explosive limits

Flammability limit - upper (%): 10.9 %

Flammability limit - lower (%): 1.7 %

Explosive limit - upper (%): No data available.

Explosive limit - lower (%): No data available.

Vapor pressure: 8.80 kPa (25 °C)

Vapor density: 2.55 (Air=1)

Relative density: 0.80 (Water=1)

Solubility(ies)

Solubility in water: 95 g/l (20 °C)

Solubility (other): No data available.

Partition coefficient (n-octanol/water): -0.76

Auto-ignition temperature: 415 °C

Decomposition temperature: No data available.

Viscosity: 4.00 mm²/s at 20 °C -

Molecular Weight: 74.12

Section 10 - Stability and Reactivity

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Material is stable under normal conditions.

Possibility of hazardous reactions: Hazardous polymerization does not occur.

Conditions to avoid: Heat, sparks, flames. Contact with incompatible materials.

Incompatible materials: Strong oxidizing agents. Acids. Aldehydes. Isocyanates

Hazardous decomposition products: Thermal decomposition may release oxides of carbon.

Section 11 - Toxicological Information

Information on likely routes of exposure

Ingestion: May be harmful if swallowed.

Inhalation: Irritating to respiratory system. May cause central nervous system effects.

Skin contact: May be harmful in contact with skin. Causes skin irritation. .

Eye contact: Causes serious eye irritation.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral Product: LD 50 (Rat): 2,460 mg/kg

Dermal Product: LD 50 (Rabbit): 3,392 mg/kg

Inhalation Product: LC 50 (Mouse, 4 h): 8,000 mg/l

Repeated dose toxicity Product: No data available.

Skin corrosion/irritation Product: Causes mild skin irritation.

Serious eye damage/eye irritation Product: Causes serious eye damage. .

Respiratory or skin sensitization Product: Not a skin sensitizer.

Carcinogenicity Product: . No data available

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:

No carcinogenic components identified

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):

No carcinogenic components identified

Germ cell mutagenicity

In vitro Product: No mutagenic components identified

In vivo Product: No mutagenic components identified

Reproductive toxicity Product: No data available

Specific target organ toxicity - single exposure Product: Narcotic effect., Respiratory tract irritation.

Specific target organ toxicity - repeated exposure Product: No data available

Aspiration hazard Product: Not classified

Other effects: None known.

Section 12 - Ecological Information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish

Product: No data available.

Specified substance(s): Isobutyl alcohol LC 50 (Bleak (*Alburnus alburnus*), 96 h): 1,000 - 3,000 mg/l Mortality
LC 50 (Rainbow trout, donaldson trout (*Oncorhynchus mykiss*), 96 h): 1,120 - 1,520 mg/l Mortality
LC 50 (Fathead minnow (*Pimephales promelas*), 96 h): 1,370 - 1,490 mg/l Mortality
LC 50 (Channel catfish (*Ictalurus punctatus*), 96 h): 1,250 - 1,690 mg/l Mortality
LC 50 (Bluegill (*Lepomis macrochirus*), 96 h): 1,480 - 1,730 mg/l Mortality

Aquatic Invertebrates

Product: No data available.

Specified substance(s): Isobutyl alcohol LC 50 (Water flea (*Daphnia magna*), 48 h): 894 - 1,200 mg/l Mortality
LC 50 (Brine shrimp (*Artemia salina*), 48 h): 600 mg/l Mortality
EC 50 (Water flea (*Daphnia pulex*), 48 h): 950 - 1,200 mg/l Intoxication

EC 50 (Water flea (Ceriodaphnia reticulata), 48 h): 1,100 - 1,300 mg/l Intoxication

EC 50 (Water flea (Daphnia magna), 48 h): 1,070 - 1,933 mg/l Intoxication

Chronic hazards to the aquatic environment:

Fish Product: No data available.

Aquatic Invertebrates Product: No data available.

Toxicity to Aquatic Plants Product: No data available.

Persistence and Degradability

Biodegradation Product: There are no data on the degradability of this product. .

BOD/COD Ratio Product: No data available.

Bioaccumulative Potential

Bioconcentration Factor (BCF) Product: No data available on bioaccumulation.

Partition Coefficient n-octanol / water (log Kow) Product: Log Kow: 0.76

Mobility in soil: The product is partly soluble in water. May spread in the aquatic environment.

Other adverse effects: The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. . .

Section 13 - Disposal Considerations

Disposal instructions: Discharge, treatment, or disposal may be subject to national, state, or local laws. 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.

Contaminated packaging: Since emptied containers retain product residue, follow label warnings even after container is emptied.

Section 14 - Transport Information

DOT

UN number: UN 1212
UN proper shipping name: Isobutanol
Transport hazard class(es)
Class(es): 3
Label(s): 3
Packing group: III
Marine Pollutant: No

IMDG

UN number: UN 1212
UN proper shipping name: Isobutanol
Transport hazard class(es)
Class(es): 3
Label(s): 3
EmS No.: F-E, S-D
Packing group: III
Marine Pollutant: No

IATA

UN number: UN 1212

Proper Shipping Name: Isobutanol
Transport hazard class(es):
Class(es): 3
Label(s): 3
Marine Pollutant: No
Packing group: III

Section 15 - Regulatory Information

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

ISOBUTYL ALCOHOL Reportable quantity: 5000 lbs.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

X Acute (Immediate) X Chronic (Delayed) X Fire Reactive Pressure Generating

SARA 302 Extremely Hazardous Substance

None present or none present in regulated quantities.

SARA 304 Emergency Release Notification

Chemical Identity	RQ
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ISOBUTYL ALCOHOL	5000 lbs.
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SARA 311/312 Hazardous Chemical

Chemical Identity	Threshold Planning Quantity
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ISOBUTYL ALCOHOL	500 lbs
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SARA 313 (TRI Reporting)

None present or none present in regulated quantities

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

None present or none present in regulated quantities.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

None present or none present in regulated quantities.

US State Regulations

US. California Proposition 65

No ingredient regulated by CA Prop 65 present.

US. New Jersey Worker and Community Right-to-Know Act

ISOBUTYL ALCOHOL Listed

US. Massachusetts RTK - Substance List

ISOBUTYL ALCOHOL Listed

US. Pennsylvania RTK - Hazardous Substances

ISOBUTYL ALCOHOL Listed

US. Rhode Island RTK

ISOBUTYL ALCOHOL Listed

Inventory Status:

Australia AICS: On or in compliance with the inventory

Canada DSL Inventory List: On or in compliance with the inventory

EU EINECS List: On or in compliance with the inventory

EU ELINCS List: Not in compliance with the inventory.
Japan (ENCS) List: Not in compliance with the inventory
EU No Longer Polymers List: Not in compliance with the inventory.
China Inv. Existing Chemical Substances: Not in compliance with the inventory
Korea Existing Chemicals Inv. (KECI): On or in compliance with the inventory
Canada NDSL Inventory: Not in compliance with the inventory.
Philippines PICCS: On or in compliance with the inventory
US TSCA Inventory: On or in compliance with the inventory
New Zealand Inventory of Chemicals: On or in compliance with the inventory
Japan ISHL Listing: On or in compliance with the inventory
Japan Pharmacopoeia Listing: Not in compliance with the inventory.

Section 16 - Other Information

Sources : KOSHA, National Emergency Management Agency

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