OCI Company Ltd.

Material Safety Data Sheet

MSDS

Isopropyl Alcohol

Section 1 - Chemical Product and Company Identification

Product name : Isopropyl 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 Liquid : 2

Serious eye damage / Eye irritation : 2

Toxic to reproduction: 2

Specific target organ toxicity following single exposure : 3 ((Respiratory System)

Aspiration hazard : 2

2) Warning signal

Symbol

Signal word: Danger

Hazard statement:

H225 Highly flammable liquid and vapour

H305 May be harmful if swallowed and enters airways

H319 Causes serious eye irritation

H336 May cause drowsiness or dizziness

Prevention precautionary statements

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

P233 Keep container tightly closed.

P240 Ground/bond container and receiving equipment.

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

P242 Use only non-sparking tools.

P243 Take precautionary measures against static discharge.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P281 Use personal protective equipment as required.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P307+P311 IF exposed: Call a POISON CENTER or doctor/physician
P308+P313 IF exposed or concerned: Get medical advice/attention.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P314 Get medical advice/attention if you feel unwell.
P321 Specific treatment
P331 Do NOT induce vomiting.
P337+P313 If eye irritation persists: Get medical advice/attention.
P370+P378 In case of fire: Use for extinction.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P501 Dispose of contents/container to the related laws.

3) NFPA

Health Rating	2
Flammability Rating	3
Reactivity Rating	0

Section 3 - Composition, Information on Ingredients

Component : Isopropyl Alcohol
CAS No.: 67-63-0
Content : 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. Rinse mouth. Do NOT induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
Inhalation: Move to fresh air. Get medical attention if symptoms persist.

Skin Contact: Wash skin thoroughly with soap and water. Get medical attention if symptoms occur. Remove contaminated clothing and shoes. Wash contaminated clothing before reuse.

Eye contact: Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention.

Most important symptoms/effects, acute and delayed

Symptoms: Irritating to eyes, respiratory system and skin.

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. Vapor from the solvent may accumulate in container headspace resulting in flammability hazard. 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). Avoid breathing mists or vapors. Keep upwind. Ventilate closed spaces before entering them. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. See Section 8 of the SDS for Personal Protective Equipment. Keep unauthorized personnel away.

Methods and material for containment and cleaning up: Eliminate all ignition sources if safe to do so. Use only non-sparking tools. Take precautionary measures against static discharges. Stop leak if possible without any risk. 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 until all safety precautions have been read and understood. 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 and 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. Do not breathe mist or vapor. 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

Occupational exposure limit, biological exposure limit

Domestic regulations	TWA 200 ppm	STEL 400 ppm
ACGIH	TWA 200 ppm	STEL 400 ppm
Biological exposure limit	40 mg/L of acetone in urine (after last work of work week)	

Appropriate Engineering Controls :

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.

Personal protective equipment

Respiratory protection : In case of inadequate ventilation use suitable respirator. Chemical respirator with organic vapor cartridge.

Because it is concerned about the harmfulness of human body due to chemical substances, it is recommended to wear respiratory protective equipment with canister mask or gas filter in consideration of physical and chemical characteristics when handling.

Respiratory protection should be certified by the Health and Safety Authority.

It is concerned about the harmfulness of the human body depending on the working environment, it should wear respirator, air-purifying respirator

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

Hand Protection: Chemical resistant gloves

Skin & Body Protection : Wear suitable protective clothing

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. Avoid contact with eyes, skin, and clothing.

Section 9 - Physical and Chemical Properties

Appearance

Physical state: Liquid

Color: Colorless
Odor: Odor of alcohol
Odor threshold: 90 mg/㎥
pH: No data available.
Melting point/freezing point: -90 °C
Initial boiling point and boiling range: 83 °C
Flash Point: 11.7 °C
Evaporation rate: 1.7 (Butyl Acetate =1)
Flammability (solid, gas): Flammable liquid
Upper/lower limit on flammability or explosive limits
Flammability limit - upper (%): 12%
Flammability limit - lower (%): 2%
Explosive limit - upper (%): No data available.
Explosive limit - lower (%): No data available.
Vapor pressure: 4.4 ㎪ (20℃)
Vapor density: 2.1
Relative density: 0.79 (Water=1)
Solubility(ies)
Solubility in water: 100 g/100㎖
Solubility (other): No data available.
Partition coefficient (n-octanol/water): 0.05
Auto-ignition temperature: 456°C
Decomposition temperature: No data available.
Viscosity: 21 cP (25℃)
Molecular weight: 60.1

Section 10 - Stability and Reactivity

Chemical Stability & Possibility of hazardous reactions
Material is stable under normal conditions.
No dangerous reaction known under conditions of normal use.
Hazardous polymerization does not occur.
Conditions to avoid: Heat, sparks, flames. Sunlight.
Incompatible Materials: Strong oxidizing agents. Acetaldehyde. Acids. Chlorine. Ethylene Oxide Hydrogen peroxide (H2O2) Sulfuric acid. Isocyanates. Aluminum.
Hazardous Decomposition Products: Thermal decomposition may release oxides of carbon.

Section 11 - Toxicological Information

Information on likely routes of exposure : No data available.
Information on health hazards
Acute toxicity
Oral : LD50 5840 ㎎/㎏ Rat
Dermal : LD50 12800 ㎎/㎏ Rabbit
Inhalation : Vapor 72.6 ㎎/ℓ 4 hr Rat (HSDB), LC50 >10000 ppm 6 hr Rat

Skin Corrosion/Irritation : No skin irritation in skin irritation studies in rabbits and guinea pigs
Serious Eye Damage/Eye Irritation : According to OECD Guide line 405 (Acute Eye Irritation/Corrosion), eye irritation was observed in rabbits.
Respiratory Sensitization : No data available.
Skin Sensitization : No sensitization as a result of guinea pig test according to OECD Guide line 406 (skin sensitization)
Carcinogenicity : This substance has no evidence of carcinogenic properties.
Occupational Safety and Health Act : Not applicable
Notice of Ministry of Employment and Labor : Not applicable
IARC : 3
OSHA : Not applicable
ACGIH : A4
NTP : Not applicable
EU CLP : Not applicable
Germ Cell Mutagenicity
In vitro gene mutation study test result in mammalian cells: negative with or without metabolic activation system
Test result according to OECD Guide line 474 (mammalian red blood cell micronucleus test): negative
Reproductive toxicity : As a result of OECD Guideline 416 (second-generation reproductive toxicity study), the liver weight was relatively increased in females in the medium to high dose group, and the kidney weight increased in the high dose group.
No evidence of fetal toxicity or teratogenicity was reported as a result of a study according to OECD Guide line 414 (Fetal Developmental Toxicity Study).
Specific Target Organ Toxicity - Single Exposure : According to OECD Guide line 426 (developmental neurotoxicity study), anesthetic action was observed.
Specific Target Organ Toxicity - Repeated Exposure : As a result of the OECD Guide line 451 subchronic repeatedinhalation toxicity study, hypoactivity, reduced reflex response, and anesthetic action were observed. Weight change, kidny weight increase with kidny change.
Aspiration Hazard Product: Death due to cardiopulmonary arrest was recognized within 24 hours of intraocular administration in test mice, and the kinematic viscosity was about 1.6.
Respiratory toxicity may occur when inhaled at around 1.6mm2/s
Other effects: None known.

Section 12 - Ecological Information

Ecotoxicity:
Fish : LC50 9640 ㎎/ℓ 96 hr Pimephales promelas(OECD Guideline 203)
Invertebrates : LC50 5102 ㎎/ℓ 24 hr Daphnia magna(OECD TG 202)
Aquatic algae : EC50 1800 ㎎/ℓ 7 day (Scenedesmus quadricauda, reliability: 2)
Persistence and degradability
Persistence : log Kow 0.05
Degradability : BOD5/COD 0.5
Bioaccumulative potential
Concentrations : BOD5/COD 0.5
Biodegradability : Presumed to have low bioaccumulation potential. Log Kow < 3

Mobility in soil: log koc = 0.03(43hPa, 20℃)
Other adverse effects: No data available.

Section 13 - Disposal Considerations

Waste methods : If specified in the Waste Management Act, waste contents and containers in accordance with the regulations.
Precautions for Waste : Consider the precautions specified in the regulations when specified in the Waste Management Act

Section 14 - Transport Information

UN Number : 1219
Shipping Name : ISOPROPANOL(ISOPROPYL ALCOHOL)
Hazard Class : 3
Packing Group : II
Marine pollutnat : Not applicable
Particular safety Measures for transportation :
Fire emergency measures : F-E
Leakage emergency measures : S-D

Section 15 - Regulatory Information

Occupation safety and health acts Standard material of exposure :
Standard material of exposure
Test material of working environment(Test period; 6months)
Hazardous material of administration objective
Special diagnosis material of health(Diagnosis period; 12months)
Substances subjecter to Process Safety Management report(PSM) submission
Chemical Substances Control Act : Not applicable
National law of Safety management of hazardous material : 4 Class Alcohol 400 L
National law of management of Wastes : Designated Waste
Other domestic and foreign law :
EU classification information (confirmed classification result) : F; R11 Xi; R36 R67
EU classification information (risk statements) ; H225, H336, H319
EU classification information (safety statements) : S2, S7, S16, S24/25, S26

Section 16 - Other Information

Sources : KOSHA, National Emergency Management Agency
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