

MATERIAL SAFETY DATA SHEET - ISOPROPYL RUBBING ALCOHOL 99%

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1. IDENTIFICATION

Product Name: **ISOPROPYL ALCOHOL 99%**

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Composition/Purity of Hazardous Ingredients: Isopropyl Alcohol 99%

IUPAC Chemical Name: 2-Propanol

Synonym(s):
* Sec-Propyl Alcohol
* Isopropanol
* Dimethylcarbinol
* Alcohol Isopropylique

CAS Registry Number: 67-63-0

PIN-UN/NA Number(s): 1219

TDG Classification (Class, Division and Packing Group): 3 II

Chemical Family: Aliphatic Alcohol

Molecular Formula: C3-H8-O

Structural Formula: CH3-CH(OH)-CH3

WHMIS Classification: B2, D2B

Warning Properties: Toxic, Flammable.

General Descriptions

Appearance, Odour and State: Colourless liquid with odour of rubbing alcohol

Odour Threshold: 22-200 ppm (Can be detected below the recommended exposure limit.)

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Uses and Occurrences: Manufacturer of acetone and its derivatives, glycerol and isopropyl acetate; solvent for oils; alkaloids, gums, resins, cellulose derivatives; coatings and lacquers; used as a de-icing agent for liquid fuels; dehydrating agent, denaturant, preservative in extraction processes, and as an antiseptic in the 30-50% concentration range.

2. PHYSICAL DATA

Boiling Point: 82 deg. C (180 deg. F)
Molecular Weight: 60.09 (amu)
Melting Point/Freezing Point: -86 deg. C (-122 deg. F)
Specific Gravity (Water=1): .785
Solubility in Water: 100%
pH: N/A
Solubility in Other Liquids: Miscible with most organic solvents in addition to alkaloids, essential oils, gums, shellac, phenolic resins, chloroform and most petroleum solvents. It is not miscible in salt solutions.
Vapour Density: 2.07
Vapour Pressure: 33 mm Hg @ 20 deg. C
% Volatiles: 100
Saturation Vapour Concentration: 142 g/m³ @ 25 deg. C
Evaporation Rate (Butyl Acetate = 1): 2.3
Co-efficient of Water/Oil Distribution: No data

3. FIRE AND EXPLOSION HAZARDS

Flash Point and Method: 12 deg. C (52 deg. F) closed cup;
17 deg. C (63 deg. F) open cup;
Lower Explosive Limit/Lower Flammable Limit (%): 2.0 %
Upper Explosive Limit/Upper Flammable Limit (%): 12%
Autoignition Temperature: 399 deg. C (750 deg. F)
Extinguishing Media: Carbon dioxide, dry chemical, alcohol foam.
Special Fire Fighting Procedures: Water is not generally suitable for fighting fires involving this material due to its low flash point. However, water can be used in the form of a spray or mist to absorb heat, keep containers cool and protect exposed material.
Combustion Products: Carbon dioxide (CO₂) and carbon monoxide (CO)
Hazardous Explosion Data
- Sensitivity to Impact: No Data.
- Sensitivity to

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Static Discharge: No Data.

4. REACTIVITY DATA

Chemical Stability: Normally stable.

Incompatibility: Strong Oxidizing Agents (ie. nitrates, perchlorates, peroxides) - increased risk of fire and explosion Phosgene- forms isopropyl chloroformate and hydrogen chloride Iron Salts - explosive thermal decomposition may occur Hydrogen Palladium mixture can ignite in air Potassium T- Butoxide Nitroform. Avoid high temperatures, sparks, open flames and other sources of ignition.

Hazardous Decomposition Products: None

Hazardous Polymerization: Does not occur.

Corrosiveness to Metals: Not corrosive.

5. HEALTH HAZARD DATA

A. Routes of Entry

	<u>Yes</u>	<u>No</u>
i) Inhalation	X	
ii) Eye Contact	X	
iii) Skin Contact	X	
iv) Skin Absorption	X	
v) Ingestion	X	

B. Effects of Short-Term (Acute Exposure)

Inhalation: Mild irritation of the upper respiratory tract at 400 ppm. High concentrations can cause drowsiness, ataxia (in coordination) and deep narcosis. Move victim to fresh air. Obtain medical attention immediately.

Eye Contact: Vapour mildly irritating at 400 ppm. Direct eye contact with the liquid can cause severe irritation.

Skin Contact: Brief exposures are not irritating. Absorption through the skin does not readily occur so toxic doses are not likely to happen through this route. Wash affected areas thoroughly with soap and water.

Ingestion: May cause drowsiness, gastrointestinal pain, cramps, nausea, vomiting and diarrhoea; unconsciousness and death following massive exposures. Lethal dose for humans is estimated to be approximately 131 grams. The emetic

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effects of isopropyl alcohol limit the possibility of ingesting a fatal dose. If victim is alert and not convulsing, rinse mouth out and give ½ to 1 glass of water to dilute material.

C. Animal Toxicity Data

Toxicity: LD50 (rat, oral): 4.42 5.84 g/kg LD50 (mouse, oral): 4.8 g/kg LD50 (rabbit, oral): 7.9 g/kg LD50 (rabbit, dermal): 13 g/kg Irritant dose (rabbit, skin): 500 mg/24 hours (mild skin irritant) Irritant dose (rabbit, eye): 0.1 ml 70% solution (severe eye irritant) Experiments on animals showed little absorption of alcohol intoxication of animals are mild leg paralysis, unsteadiness, lack of muscular coordination, respiratory depression and stupor. No serious long-term effects have been reported in animals.

D. Effects of Long-Term (Chronic) Exposure

Irritancy of Product:

Skin: Repeated or prolonged skin contact can cause drying and cracking.

Ingestion/Inhalation: No significant changes were found in the chemical or cellular compositions of the blood and urine after humans ingested 6.4 mg/kg of isopropyl alcohol on a daily basis for six weeks. No long-term health effects have been reported in humans.

Sensitizing Capability: No data.

Carcinogenicity: No carcinogenic by animal testing.

Mutagenicity: Negative in animals.

Teratogenicity: No reproductive effects in animal testing

Synergistic Materials: May interact with chlorinated solvents.

E. Occupational Exposure Limits

Threshold Limited Values (TLVS): ACGIH / NIOSH

Time-Weighted Average (TLV-TWA): 400 ppm (980 mg/m³)

Short-Term Exposure Limit (TLV-STEL): 500 ppm (1225 mg/m³)

6. FIRST AID

IN ALL CASES GET IMMEDIATE MEDICAL ATTENTION!

Inhalation: Remove source of contamination or move victim to fresh air. Begin artificial respiration immediately if victim is not breathing.

Eye Contact: As quickly as possible, begin rinsing affected eye(s) thoroughly with lukewarm, gentle running water for at least 15 minutes.

Skin Contact: Wash skin with lots of soap and water. Remove contaminated clothing and shoes. Launder before reusing or discard.

Ingestion: Unless unconscious or convulsing, induce vomiting by having the victim drink a large amount of water.

Special Equipment/Antidotes: None needed

First Aid Comments: Provide general supportive measures, (warmth, comfort and rest). Consult a physician and/or the nearest Poison Control Centre for all cases of ingestion or eye contact and all but trivial cases of inhalation or skin contact.

7. PREVENTATIVE MEASURES

A. Environmental and Disposal Information

Spill and Leak Procedures: Provide adequate protective equipment and ventilation. Remove sources of heat and flame. Stop the flow if it can be done safely. Contain the spill. Recover liquid for recycling or disposal if feasible. Otherwise absorb the liquid on clay or other absorbent material.

Disposal: Dispose of in designated landfill site or burn in an approved solvent burner. If small amounts are disposed of into a sink or sewer, rinse with ample water to prevent the accumulation of flammable vapours. Notify environmental agencies in the event of any significant release of this material into the environment. Confirm disposal practices with regulatory agencies.

B. Storage and Handling

Storage: Store in tightly closed electrically grounded containers in a cool area separate from normal work areas. The storage area should have adequate independent ventilation and have no

sources of heat or sparks. Fans and other electric motors should be spark resistant.

Handling:

Use in minimal quantities in designated areas with adequate ventilation and away from sources of heat or sparks. Containers should be electrically grounded during transfer or mixing operations. Containers should be covered when not in use and should be stored in a grounded, fire resistant cabinet. Whenever possible, fire resistant containers should be used.

Exposure Control:

Exposure to this material can be controlled in many ways. The measures appropriate for a particular worksite depend on how this material is used and on the extent of exposure. Use this general information to help develop specific control measures. Ensure that control systems are properly designed and maintained. Comply with occupational, environmental, fire and other applicable regulations.

Engineering Controls:

Engineering control methods to reduce hazardous exposures are preferred. Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions and process modification (ie. substitution of a less hazardous material). Administrative controls and personal protective equipment may also be required. Use a non-sparking grounded ventilation system separate from other exhaust ventilation systems. Exhaust directly to the outside. Supply sufficient replacement air to make up for air removed by exhaust systems. It should be remembered that toxic levels of vapours are reached before explosive limits and these should be included in the design criteria for ventilation. As well, the type of ventilation equipment, location and capacity will depend on vapour density, dead air spaces, temperature, convection currents, wind direction, etc.

C. Personal Protective Equipment**Respiratory Protection:**

If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal protective equipment including approved respiratory protection. Have appropriate equipment available for use in emergencies such as spills or fire. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

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Refer to the CSA Standard Z94.4-M1982, "Selection, Care, and Use of Respirators," available from the Canadian Standards Association, Rexdale, Ontario M9S 1R3

Respiratory Protection Guidelines:

NIOSH RECOMMENDATIONS FOR ISOPROPYL ALCOHOL CONCENTRATIONS IN AIR: Up to 1000 ppm: Powered air-purifying respirator with organic vapour cartridge(s). Up to 10,000 ppm: SAR operated in a continuous flow mode. Up to 12,000 ppm: Gas mask with organic vapour canister; or full-facepiece SAR. EMERGENCY OR PLANNED ENTRY IN UNKNOWN CONCENTRATION OR IDLH CONDITIONS: Positive pressure, full face piece SAR with an auxiliary positive pressure SCBA. ESCAPE: Gas mask with organic vapour canister; or escape-type SCBA. Note: The IDLH concentration for isopropyl alcohol is 2,000 ppm. Note: Substance causes eye irritation or damage; eye protection needed. ABBREVIATIONS: SAR = supplied-air respirator; SCBA = self-contained breathing apparatus. IDLH = Immediately Dangerous to Life or Health. NOTE: in these recommendations, the IDLH concentration is defined as the maximum concentration which would not cause any escape-impairing systems or irreversible health effects to a person exposed for 30 minutes if the respirator failed. Recall that if the worker is using a canister-type gas mask it will not protect against low oxygen concentrations in the environment. The oxygen content of the room should not be less than 16% by volume.

Eye/Face Protection:

Chemical splash goggles or full face mask to protect eyes from liquid or concentrated vapours.

Skin Protection:

Gloves, coveralls, boots, etc. to prevent exposure of skin to liquid or concentrated vapours.

Resistance of Materials for Protective Clothing:

EXCELLENT - Neoprene, natural rubber or latex, Buna-N, polyethylene GOOD - Polyvinyl chloride (PVC) FAIR - Polyvinyl alcohol (PVA) note: Resistance of special materials can vary from product to product. Evaluate resistance under conditions of use and maintain clothing carefully.

Personal Protection Comments:

Remove contaminated clothing promptly. Keep contaminated clothing in closed containers. Discard or launder before re-wearing. Do not eat, drink or smoke in work areas. Wash hands

thoroughly after handling this material. Maintain good housekeeping. Remember that personal protective equipment is not an adequate substitute for good, safe, working conditions, adequate ventilation and intelligent conduct in the workplace.

8. REFERENCES

Mackison, F.W.; Stricoff, R.S.; Partridge, L.J., eds. Occupational Health Guidelines for Isopropyl Alcohol. In: Occupational Health Guidelines for Chemical Hazards (DHHS (NIOSH) Publication; N° 81-123). Washington, D.C.:NIOSH/OSHA, 1981

Wimer, W.W.; Russel, J.A.; Kaplan, H.L. Alcohols Toxicology. Park Ridge, NJ: Noyes Data Corporation, 1983. p.46-55

Rowe, V.K.I.; McCollister, C.B., Alcohols. In: Clayton, G.D.; Clayton, F.E., ed. Patty's Industrial Hygiene and Toxicology. 3rd Revised Edition. Vol. 2c Toxicology. New York; Toronto, Ontario: Wiley-Interscience, 1982. p. 4527-4708.

NIOSH Pocket Guide to Chemical Hazards (Repr. With corr.) NIOSH, Feb 1987 p.144-145

- Canada Centre for Occupational Health and Safety.

- Trade names - data base

- CHEM INFO - data base

- RTECS - data base

- Supplier Material Safety Data Sheets

- Manufacturing Chemists Association - Material Safety Data Sheets.

- American Conference of Governmental Industrial Hygienists Handbook of Threshold Limit Values and Biological Indices.

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