

Material Safety Data for: Isopropyl Alcohol

1. PRODUCT IDENTIFICATION

Name 2-propanol
Synonyms isopropanol, 2-hydroxypropane, sec-propyl alcohol, IPA
CAS# 67-63-0
Product Uses solvent, disinfectant, organic synthesis, pharmaceuticals

2. <u>INGREDIENTS</u>	%	TWAEV / TLV mg/m ³	LD ₅₀ ORAL	(mg/kg) SKIN	LC ₅₀ ppm INHALATION
2-propanol	100%	200 / 490	1540	12,900	14,800

3. (a) HAZARDS SUMMARY

Hazards, Quick Guide: flammable liquid, heavy vapour can travel, distant ignition and flashback are possible, irritating to eyes

Canada – WHMIS
Key:

B 2, D 2B eye irritation
B 2 – Flash Point <38°C, **B 3** – Flash Point >38°C & <93°C
D 1 – Immediately Toxic, **D 2** – Chronic Toxicity
C – Oxidising Substance, **E** – Corrosive

U.S.A. – HMIS
Key:

Health – 1, Fire – 3, Reactivity – 0
0=minimal, **1**=slight, **2**=moderate, **3**=serious, **4**=severe

3. (b) HAZARDS – TOXICITY

Effects, Acute Exposure

Skin Contact very mild irritant
Skin Absorption slight; toxic effects unlikely by this route
Eye Contact liquid irritating; vapour irritating above 400ppm; 800ppm considered highly unpleasant
Inhalation 400ppm mildly irritating; 800ppm very unpleasant; headache, dizziness, drowsiness, intoxication and lack of co-ordination
Ingestion headache, dizziness, drowsiness, intoxication and lack of co-ordination

Effects, Chronic Exposure

General prolonged or repeated exposure may cause dermatitis
Sensitising not a sensitiser
Carcinogen/Tumorigen not known to be a tumorigen or a carcinogen in humans or animals
Reproductive Effect no known effect on humans; fetotoxic in animals – only at doses also causing maternal toxicity
Mutagen not known to be a mutagen or teratogen in humans or animals
Synergistic With not known
LD₅₀ (oral) >5000mg/kg (rat), 3600mg/kg (mouse), 4710mg/kg (cat), 6410mg/kg (rabbit), 1540mg/kg (dog)
LD₅₀ (skin) 12,900mg/kg (rabbit)
LC₅₀ (inhalation) 10,800ppm (mouse), 14,800, 16,000 & 17,000ppm (rat)

Please ensure that this MSDS is given to, and explained to people using this product.

(Isopropyl Alcohol, cont'd)

page 2

4. FIRST AID

- SKIN: Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.
- EYES: Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.
- INHALATION: Remove from contaminated area promptly. **CAUTION: Rescuer must not endanger himself!** If breathing stops, administer artificial respiration and seek medical aid promptly.
- INGESTION: Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

5. PHYSICAL PROPERTIES

Odour & Appearance	clear, colourless, mobile liquid with strong odour of rubbing alcohol
Odour Threshold	~40ppm – varies widely
Vapour Pressure	33mmHg / 4.4kPa (20°C/ 68°F)
Vapour Density (air = 1)	2.1
Evaporation Rate (<i>Butyl Acetate=1</i>)	1.5
Boiling Point	82°C / 180°F
Freezing Point	-88.5°C / -127°F
Specific Gravity	0.786 (20/20°C)
Water Solubility	complete
- in other solvents	most organic solvents
Viscosity	2.4centipoise (20°C / 68°F)
pH	none – does not yield hydrogen ions in solution
Molecular Weight	60 grams per mole
Conversion Factor	1ppm = 4.9mg/m ³

6. FLAMMABILITY & FIRE FIGHTING

Flash Point	12°C / 53°F (closed cup)
Autoignition Temperature	399°C / 750°F
Flammable Limits	2.0% – 12%
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Fire Fighting Precautions	foam, dry chemical, water fog or spray to cool & dilute; fire fighters must wear SCBA
Static Discharge	cannot accumulate a static charge

7. STABILITY / REACTIVITY

Dangerously Reactive With	strong oxidising agents; strong acids; acid anhydrides; alkali metals or alkaline earth metals
Also Reactive With	ethylene oxide, phosgene, crotonaldehyde, or isocyanates
Chemical Stability	stable; will not polymerize
Decomposes in Presence of	together oxygen (air) & light slowly convert isopropanol into potentially explosive peroxides
Decomposition Products	none apart from Hazardous Combustion Products
Mechanical Impact	not sensitive

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(Isopropyl Alcohol, cont'd)

Page 3

8. PROTECTIVE EQUIPMENT / EXPOSURE CONTROL

ACGIH TLV	200ppm / 490mg/m ³ ; STEL 400ppm / 980mg/m ³
OSHA PEL	400ppm / 980mg/m ³ ; STEL 500ppm / 1225mg/m ³
Ventilation	mechanical ventilation may be required to maintain airborne vapour or mist concentrations below TLV; a respirator with organic vapour cartridge should be available for escape purposes, should ventilation fail (<i>always store respirator in an airtight container [eg: "Tupperware"] to maintain cartridge "freshness"</i>)
Hands	butyl, neoprene or nitrile gloves – <i>always confirm suitability with supplier</i>
Eyes	safety glasses with side shields – <i>always protect eyes</i>
Clothing	no special protective clothing required

9. HANDLING & STORAGE

Store and use in a cool dry environment, away from sources of ignition, heat and oxidising agents. **Take great care to avoid sparks – use non-sparking bronze or aluminum hand tools. All electrical and mechanical equipment (lighting, switchgear, forklift trucks, etc) used with or around this product must be explosion-proof.**

Although this product does not accumulate a static charge on agitation or transfer, in view of the low flash point it is prudent to ground containers, mixers, and transfer equipment before handling to prevent static discharge. On transfer, ensure that the delivery nozzle is below the surface in the receiving container to prevent splash.

Empty containers may contain a flammable/explosive vapour. Never cut, drill, weld or grind on or near this container, whether empty or full. *Always replace drum, pail or IBC cap prior to moving the container!*

Avoid breathing product vapour. Use with adequate ventilation to maintain airborne concentration of the product below the TLV (see IX above). If dealing with a spill, and ventilation is impractical, wear a respirator with organic vapour cartridge. *If the spill is extensive, use an air-supplied respirator.* Avoid prolonged contact with skin and wash work clothes frequently. An eye bath and safety shower should be available near the workplace.

10. SPILL PROCEDURES

Serious Fire Potential: blanket spill with foam as a precaution against accidental ignition. Take extreme care to avoid sparks – do not operate (turn on OR off) electrical appliances near spill, unless explosion proof.

Leak Precaution	dyke to control spillage and prevent environmental contamination
Handling Spill	ventilate contaminated area; recover free liquid with explosion-proof pumps; absorb residue on an inert sorbent, pick up using non-sparking plastic or aluminium shovel, & store in closed containers for disposal
	NOTE: If spill is extensive, and ventilation is inadequate, consider wearing an air-supplied respirator.

11. DISPOSAL

Waste Disposal	do not flush to sewer; may be incinerated in approved facility with flue gas monitoring & scrubbing, mix with a suitable flammable waste before incineration; may be landfilled if local regulations permit
Containers	Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. Pails must be vented and thoroughly dried prior to crushing and recycling. IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years. <i>Never cut, drill, weld or grind on or near this container, even if empty</i>

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(Isopropyl Alcohol, cont'd)

page 4

12. ENVIRONMENTAL INFORMATION

Bioaccumulation	this product has a low potential for bioaccumulation
Biodegradation	this product degrades readily and rapidly in the presence of oxygen; >75% biodegradation in 28dy; anaerobic degradation of >65% in 20 days
Abiotic Degradation	this product reacts with atmospheric hydroxyl (OH) radicals; estimated half-life in air 3.2 days
Mobility in soil, water	this product is water soluble and moves readily through soil and the water column
Marine Toxicity	
LC ₅₀ (96 hr) (fish)	6.1 – 10.4g/l (fathead minnow – 6 tests)
LC ₅₀ (48 hr) (crustacea)	1400mg/l (brown shrimp)
EC ₅₀ (96 hr) (algae)	1000mg/l (microcystis aeruginuosa), 1800mg/l (scenedesmus guadricauda)
LC ₅₀ Microorganisms	1050mg/l (pseudomonas putida)

13. TRANSPORT REGULATIONS

Canada TDG	PIN	UN-1219
AND	Shipping Name	isopropyl alcohol OR isopropanol
U.S.A. 49 CFR	Class	3
	Packing Group	II
Marine Pollutant		not a marine pollutant

14. EMERGENCY INFORMATION

Canada	Call CANUTEC (collect)	(613) 996-6666
U.S.A.	Call CHEMTREC	(800) 424-9300

15. REGULATIONS

Canada DSL	on inventory
U.S.A. TSCA	on inventory
Europe EINECS	on inventory (EC# 200-661-7)

Immediately Dangerous to Life or Health: 2000 ppm (Based on 10% of the lower explosive limit for safety considerations even though the relevant toxicological data indicated that irreversible health effects or impairment of escape existed only at higher concentrations.)

Allowable Tolerances: Residues of isopropyl alcohol are exempted from the requirement of a tolerance when used as a solvent, cosolvent, stabilizer, inhibitor in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. Isopropyl alcohol is exempted from the requirement of a tolerance when used as a solvent, cosolvent, stabilizer, inhibitor for blended emulsifiers in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Isopropyl alcohol is exempted from the requirement of a tolerance when used as a solvent, cosolvent for blended emulsifiers in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to animals.

OSHA Standards: Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 400 ppm (980 mg/cu m). Vacated 1989 OSHA PEL TWA 400 ppm (980 mg/cu m); STEL 500 ppm (1225 mg/cu m) is still enforced in some states.

NIOSH Recommendations: Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 400 ppm (980 mg/cu m). Recommended Exposure Limit: 15 Min Short-Term Exposure Limit: 500 ppm (1225 mg/cu m).

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 200 ppm; Short Term Exposure Limit (STEL): 400 ppm A4; Not classifiable as a human carcinogen.

Atmospheric Standards: This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). The intended effect of these standards is to require all newly constructed, modified, and reconstructed SOCMI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non air quality health and environmental impact and energy requirements. Isopropanol is produced, as an intermediate or a final product, by process units covered under this subpart.

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(Isopropyl Alcohol, cont'd)

page 5

15. REGULATIONS, cont'd

State Drinking Water Guidelines: Connecticut 2300 ug/l

TSCA Requirements: Pursuant to section 8(d) of TSCA, EPA promulgated a model Health and Safety Data Reporting Rule. The section 8(d) model rule requires manufacturers, importers, and processors of listed chemical substances and mixtures to submit to EPA copies and lists of unpublished health and safety studies. 2-Propanol is included on this list.

FIFRA Requirements: Residues of isopropyl alcohol are exempted from the requirement of a tolerance when used as a solvent, cosolvent, stabilizer, inhibitor in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. Isopropyl alcohol is exempted from the requirement of a tolerance when used as a solvent, cosolvent, stabilizer, inhibitor for blended emulsifiers in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Isopropyl alcohol is exempted from the requirement of a tolerance when used as a solvent, cosolvent for blended emulsifiers in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to animals.

FDA Requirements: Isopropanol is a food additive permitted for direct addition to food for human consumption as a synthetic flavoring substance and adjuvant in accordance with the following conditions: a) they are used in the minimum quantity required to produce their intended effect, and otherwise in accordance with all the principles of good manufacturing practice, and 2) they consist of one or more of the following, used alone or in combination with flavoring substances and adjuvants generally recognized as safe in food, prior-sanctioned for such use, or regulated by an appropriate section in this part. Isopropanol is an indirect food additive for use only as a component of adhesives. Isopropyl alcohol (without residue) may be used in inks for marking food supplements in tablet form, gum, and confectionery.

16. PREPARATION INFORMATION

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577

File Name: IPA

With data from RTECS, Haz. Substance Data Base, Cheminfo (CCOHS), IUCOLID Datasheets (European Chem. Substance Info. System), & others, as available

Preparation Date: **July 2006** Revision Date: **July 2009**

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