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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

ALLYL ALCOHOL

C3-H6-O, CH2-CH-CH2-OH, "allylic alcohol", 3-hydroxypropene, 3-hydroxypropene, propenol, propen-1-ol-3, propen-1-ol-3, 1-propen-3-ol, 1-propen-3-ol, "propenyl alcohol", "2-propenyl alcohol", "2-propenyl alcohol", prop-2-enol, prop-2-enol, vinylcarbinol, orvinylcarbinol, 2-propen-1-ol, 2-propen-1-ol, 1-propenol-3, 1-propenol-3,

ALLYL ALCOHOL

■ DANGEROUS POISON.

Manufacture of allyl compounds, war gas, resins, plasticisers, pesticide.
Intermediate

Company: S D FINE - CHEM LIMITED

Address:

315- 317, T.V.IND.ESTATE,

248 WORLI ROAD,

MUMBAI- 400 030, INDIA

technical@sdfine.com

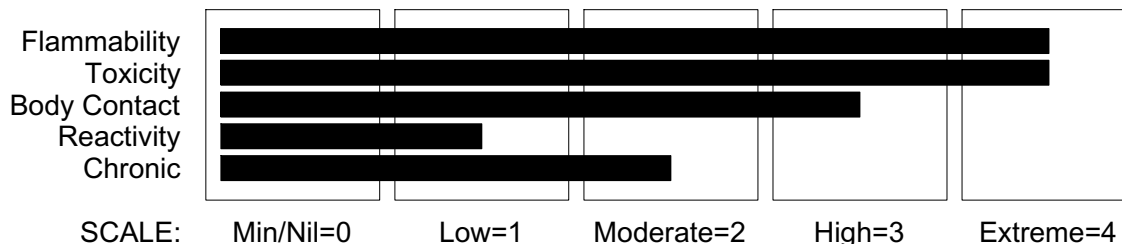
Telephone: 91- 22 24959898

Telephone: 91- 22 24959899

Fax: 91- 22 24937232

Section 2 - HAZARDS IDENTIFICATION

HAZARD RATINGS



GHS Classification

Acute Aquatic Hazard Category 1

Acute Toxicity (Dermal) Category 1

Acute Toxicity (Inhalation) Category 2

continued...

ALLYL ALCOHOL

GHS Safety Data Sheet

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Section 2 - HAZARDS IDENTIFICATION

Acute Toxicity (Oral) Category 3
Aspiration Hazard Category 1
Eye Irritation Category 2A
Flammable Liquid Category 3
Reproductive Toxicity Category 2
Respiratory Effects Category 3
Respiratory Irritation Category 3
Skin Corrosion/Irritation Category 2



EMERGENCY OVERVIEW

HAZARD

DANGER

Determined by using GHS criteria:

H335 H336 H226 H310 H330 H301 H304 H315 H319 H361 H400

May cause respiratory irritation

May cause drowsiness or dizziness

Flammable liquid and vapour

Fatal in contact with skin

Fatal if inhaled

Toxic if swallowed

May be fatal if swallowed and enters airways

Causes skin irritation

Causes serious eye irritation

Suspected of damaging the unborn child

Very toxic to aquatic life

PRECAUTIONARY STATEMENTS

Prevention

Obtain special instructions before use.

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

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

Keep container tightly closed.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting equipment

Use only non-sparking tools.

Take precautionary measures against static discharge.

Do not breathe dust/fume/gas/mist/vapours/spray.

Avoid breathing dust/fume/gas/mist/vapours/spray.

Do not get in eyes, on skin, or on clothing.

Wash thoroughly after handling.

Do not eat, drink or smoke when using this product.

Use only outdoors or in a well-ventilated area.

Avoid release to the environment.

Wear protective gloves/protective clothing/eye protection/face protection.

Use personal protective equipment as required.

Wear respiratory protection.

continued...

ALLYL ALCOHOL

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Section 2 - HAZARDS IDENTIFICATION

Response

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

IF ON SKIN: Gently wash with plenty of soap and water.

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

IF exposed or concerned: Get medical advice/ attention.

Immediately call a POISON CENTER or doctor/physician.

Call a POISON CENTER or doctor/physician if you feel unwell.

Specific treatment is urgent (see MSDS).

Rinse mouth.

Do NOT induce vomiting.

If eye irritation persists: Get medical advice/attention.

Remove/Take off immediately all contaminated clothing.

Wash contaminated clothing before reuse.

Collect spillage.

Storage

Store in a well-ventilated place. Keep container tightly closed.

Store in a well-ventilated place. Keep cool.

Store locked up.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
allyl alcohol	107-18-6	>99

Section 4 - FIRST AID MEASURES

SWALLOWED

- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Seek medical advice.
- Avoid giving milk or oils.
- Avoid giving alcohol.
- If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

EYE

- If this product comes in contact with the eyes:
 - Immediately hold eyelids apart and flush the eye continuously with running water.
 - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
 - Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
 - Transport to hospital or doctor without delay.
 - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

continued...

ALLYL ALCOHOL

Section 4 - FIRST AID MEASURES

SKIN

- If skin or hair contact occurs:
 - Quickly but gently, wipe material off skin with a dry, clean cloth.
 - Immediately remove all contaminated clothing, including footwear.
 - Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
 - Transport to hospital, or doctor.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.

NOTES TO PHYSICIAN

■ Any material aspirated during vomiting may produce lung injury. Therefore emesis should not be induced mechanically or pharmacologically. Mechanical means should be used if it is considered necessary to evacuate the stomach contents; these include gastric lavage after endotracheal intubation. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

To treat poisoning by the higher aliphatic alcohols (up to C7):

- Gastric lavage with copious amounts of water.
- It may be beneficial to instill 60 ml of mineral oil into the stomach.
- Oxygen and artificial respiration as needed.
- Electrolyte balance: it may be useful to start 500 ml. M/6 sodium bicarbonate intravenously but maintain a cautious and conservative attitude toward electrolyte replacement unless shock or severe acidosis threatens.
- To protect the liver, maintain carbohydrate intake by intravenous infusions of glucose.
- Haemodialysis if coma is deep and persistent. [GOSSELIN, SMITH HODGE: Clinical Toxicology of Commercial Products, Ed 5)

BASIC TREATMENT

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- Monitor and treat, where necessary, for shock.
- Monitor and treat, where necessary, for pulmonary oedema.
- Anticipate and treat, where necessary, for seizures.
- DO NOT use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.
- Give activated charcoal.

ADVANCED TREATMENT

- Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- Positive-pressure ventilation using a bag-valve mask might be of use.
- Monitor and treat, where necessary, for arrhythmias.
- Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- If the patient is hypoglycaemic (decreased or loss of consciousness, tachycardia, pallor, dilated pupils, diaphoresis and/or dextrose strip or glucometer readings below 50 mg), give 50% dextrose.
- Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- Drug therapy should be considered for pulmonary oedema.
- Treat seizures with diazepam.

continued...

ALLYL ALCOHOL

Section 4 - FIRST AID MEASURES

- Proparacaine hydrochloride should be used to assist eye irrigation.

EMERGENCY DEPARTMENT

- Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime. Other useful analyses include anion and osmolar gaps, arterial blood gases (ABGs), chest radiographs and electrocardiograph.
- Positive end-expiratory pressure (PEEP)-assisted ventilation may be required for acute parenchymal injury or adult respiratory distress syndrome.
- Acidosis may respond to hyperventilation and bicarbonate therapy.
- Haemodialysis might be considered in patients with severe intoxication.
- Consult a toxicologist as necessary. BRONSTEIN, A.C. and CURRANCE, P.L. EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

For C8 alcohols and above.

Symptomatic and supportive therapy is advised in managing patients.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- Alcohol stable foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.
- Water spray or fog - Large fires only.

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation (or protect in place).
- If safe, switch off electrical equipment until vapour fire hazard removed.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

FIRE/EXPLOSION HAZARD

- Liquid and vapour are flammable.
 - Moderate fire hazard when exposed to heat or flame.
 - Vapour forms an explosive mixture with air.
 - Moderate explosion hazard when exposed to heat or flame.
 - Vapour may travel a considerable distance to source of ignition.
 - Heating may cause expansion or decomposition leading to violent rupture of containers.
 - On combustion, may emit toxic fumes of carbon monoxide (CO).
- Combustion products include: carbon monoxide (CO), carbon dioxide (CO₂), other pyrolysis products typical of burning organic material.
- May emit poisonous fumes.

FIRE INCOMPATIBILITY

- Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

ALLYL ALCOHOL

Section 5 - FIRE FIGHTING MEASURES

Personal Protective Equipment

Gas tight chemical resistant suit.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb small quantities with vermiculite or other absorbent material.
- Wipe up.
- Collect residues in a flammable waste container.

MAJOR SPILLS

■ Chemical Class: alcohols and glycols

For release onto land: recommended sorbents listed in order of priority.

SORBENT TYPE	RANK	APPLICATION	COLLECTION	LIMITATIONS
--------------	------	-------------	------------	-------------

LAND SPILL - SMALL

cross- linked polymer - particulate	1	shovel	shovel	R, W, SS
cross- linked polymer - pillow sorbent clay - particulate	1	throw	pitchfork	R, DGC, RT
wood fiber - pillow	2	shovel	shovel	R, I, P
treated wood fiber - pillow	3	throw	pitchfork	R, P, DGC, RT
foamed glass - pillow	3	throw	pitchfork	DGC, RT
	4	throw	pichfork	R, P, DGC, RT

LAND SPILL - MEDIUM

cross- linked polymer - particulate	1	blower	skiploader	R, W, SS
polypropylene - particulate	2	blower	skiploader	W, SS, DGC
sorbent clay - particulate	2	blower	skiploader	R, I, W, P, DGC
polypropylene - mat	3	throw	skiploader	DGC, RT
expanded mineral - particulate	3	blower	skiploader	R, I, W, P, DGC
polyurethane - mat	4	throw	skiploader	DGC, RT

Legend

DGC: Not effective where ground cover is dense

continued...

ALLYL ALCOHOL

Section 6 - ACCIDENTAL RELEASE MEASURES

R; Not reusable

I: Not incinerable

P: Effectiveness reduced when rainy

RT: Not effective where terrain is rugged

SS: Not for use within environmentally sensitive sites

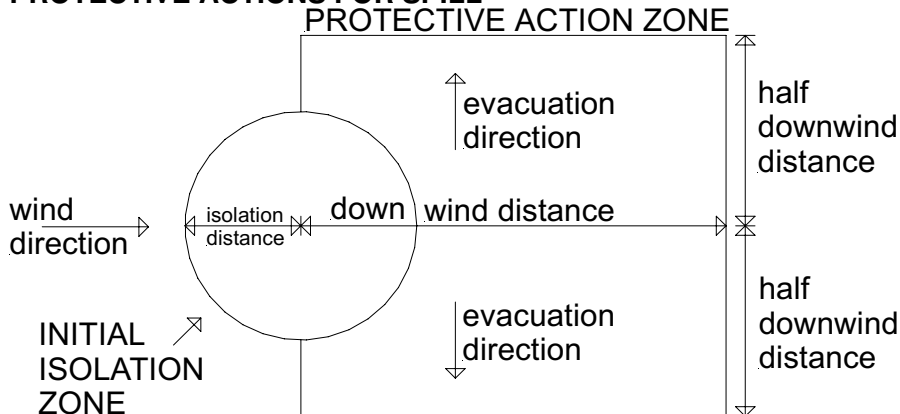
W: Effectiveness reduced when windy

Reference: Sorbents for Liquid Hazardous Substance Cleanup and Control;

R.W Melvold et al: Pollution Technology Review No. 150: Noyes Data Corporation 1988.

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Water spray or fog may be used to disperse / absorb vapour.
- Contain spill with sand, earth or vermiculite.
- Use only spark-free shovels and explosion proof equipment.
- Collect recoverable product into labelled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

PROTECTIVE ACTIONS FOR SPILL



From US Emergency Response Guide 2000
Guide 131

SMALL SPILLS

Name	Isolation Distance	Downwind Day	Protection Night
Allyl alcohol	100 ft (30 m)	0.1 mile (0.2 km)	0.1 mile (0.2 km)

LARGE SPILLS

Name	Isolation Distance	Downwind Day	Protection Night
Allyl alcohol	100 ft (30 m)	0.2 mile (0.3 km)	0.4 mile (0.6 km)

From IERG (Canada/Australia)

Isolation Distance	25 metres
Downwind Protection Distance	300 metres
IERG Number	17

FOOTNOTES

1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on

continued...

ALLYL ALCOHOL

Section 6 - ACCIDENTAL RELEASE MEASURES

either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.

2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.

3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.

4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".

LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.

5 Guide 131 is taken from the US DOT emergency response guide book.

6 IERG information is derived from CANUTEC - Transport Canada.

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- DO NOT allow clothing wet with material to stay in contact with skin.
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- DO NOT allow material to contact humans, exposed food or food utensils.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
- Containers, even those that have been emptied, may contain explosive vapours.
- Do NOT cut, drill, grind, weld or perform similar operations on or near containers.

SUITABLE CONTAINER

- Glass container is suitable for laboratory quantities.
- Lined metal can, lined metal pail/ can.
- Plastic pail.
- Polyliner drum.
- Packing as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):

- Removable head packaging;
 - Cans with friction closures and
 - low pressure tubes and cartridges
- may be used.

ALLYL ALCOHOL

Section 7 - HANDLING AND STORAGE

- Where combination packages are used, and the inner packages are of glass, there must be sufficient inert cushioning material in contact with inner and outer packages *.

- In addition, where inner packagings are glass and contain liquids of packing group I and II there must be sufficient inert absorbent to absorb any spillage *.

- * unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.

All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.

STORAGE INCOMPATIBILITY

■ For allyl alcohol:

- Avoid oleum, metal halides, concentrated sulphuric acid, diallyl phosphite, phosphorus trichloride, nitric acid, sodium, potassium, magnesium, aluminium and their alloys.
- Avoid nitric acid, and heating in the presence of caustic soda.
- Material will polymerise into a viscous, syrup-like polymer when left standing over a period of years
- Incompatible, and reacts vigorously with, strong oxidising agents.

Alcohols

- are incompatible with strong acids, acid chlorides, acid anhydrides, oxidising and reducing agents.
- reacts, possibly violently, with alkaline metals and alkaline earth metals to produce hydrogen
- react with strong acids, strong caustics, aliphatic amines, isocyanates, acetaldehyde, benzoyl peroxide, chromic acid, chromium oxide, dialkylzincs, dichlorine oxide, ethylene oxide, hypochlorous acid, isopropyl chlorocarbonate, lithium tetrahydroaluminate, nitrogen dioxide, pentafluoroguanidine, phosphorus halides, phosphorus pentasulfide, tangerine oil, triethylaluminium, triisobutylaluminium
- should not be heated above 49 deg. C. when in contact with aluminium equipment.

STORAGE REQUIREMENTS

- Polymerisation may occur slowly at room temperature.
- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Store in a cool, dry, well ventilated area away from sunlight.

Vent containers frequently, and more often in warm weather, to relieve pressure.

Electrically earth all containers.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



X



X



+



X



X



+

+: May be stored together

O: May be stored together with specific preventions

X: Must not be stored together

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

continued...

ALLYL ALCOHOL

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Notes
Australia Exposure Standards	allyl alcohol (Allyl alcohol)	2	4.8	4	9.5	Sk

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m ³)	Revised IDLH Value (ppm)
allyl alcohol		20

MATERIAL DATA

ALLYL ALCOHOL:

■ Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.

OSHA (USA) concluded that exposure to sensory irritants can:

- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

For allyl alcohol:

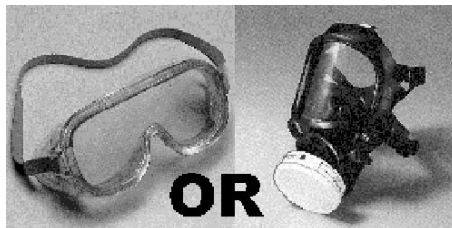
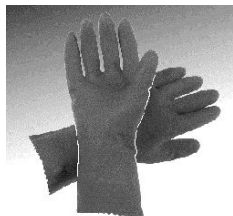
Odour Threshold Value: 1.4-2.1 ppm (detection)

NOTE: Detector tubes for allyl alcohol, measuring in excess of 20 ppm, are commercially available.

Odour Safety Factor(OSF)

OSF=0.45 (ALLYL ALCOHOL).

PERSONAL PROTECTION



EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the

continued...

ALLYL ALCOHOL

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

- Wear chemical protective gloves, eg. PVC.
- Wear safety footwear or safety gumboots, eg. Rubber.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

- Neoprene gloves.

OTHER

- Overalls.
- Eyewash unit.
- Barrier cream.
- Skin cleansing cream.
- Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.
- For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets), non sparking safety footwear.

GLOVE SELECTION INDEX

■ Glove selection is based on a modified presentation of the: "Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the computer-generated selection: allyl alcohol

■ Protective Material CPI *.

BUTYL	A
BUTYL/NEOPRENE	A
TEFLON	A
VITON/NEOPRENE	A

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

continued...

ALLYL ALCOHOL

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

RESPIRATOR

■ Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half- face Respirator	Full- Face Respirator
1000	10	A- AUS	-
1000	50	-	A- AUS
5000	50	Airline *	-
5000	100	-	A- 2
10000	100	-	A- 3
	100+		Airline**

* - Continuous Flow ** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required. For further information consult your Occupational Health and Safety Advisor.

ENGINEERING CONTROLS

■ Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection. An approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25- 0.5 m/s (50- 100 f/min.)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5- 1 m/s (100- 200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1- 2.5 m/s (200- 500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents

continued...

ALLYL ALCOHOL

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

2: Contaminants of low toxicity or of nuisance value only.

3: Intermittent, low production.

4: Large hood or large air mass in motion

2: Contaminants of high toxicity

3: High production, heavy use

4: Small hood- local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Clear, colorless, mobile liquid; pungent, mustard-like odor. Threshold odor concentration is 1.4 ppm; inhalation becomes intolerable at 25 ppm. Miscible with water, alcohol, chloroform, ether, petroleum ether. Does not biodegrade rapidly.

PHYSICAL PROPERTIES

Liquid.

Mixes with water.

Toxic or noxious vapours/gas.

State	Liquid	Molecular Weight	58.08
Melting Range (°C)	- 129	Viscosity	Not Available
Boiling Range (°C)	96.9	Solubility in water (g/L)	Miscible
Flash Point (°C)	21, 32 (open)	pH (1% solution)	Not available.
Decomposition Temp (°C)	Not Available	pH (as supplied)	Not applicable
Autoignition Temp (°C)	378	Vapour Pressure (kPa)	2.67
Upper Explosive Limit (%)	18	Specific Gravity (water=1)	0.85
Lower Explosive Limit (%)	2.5	Relative Vapour Density (air=1)	2.0
Volatile Component (%vol)	100	Evaporation Rate	Not available
Material	Value		
ALLYL ALCOHOL:			
log Kow	- 0.25- 0.17		

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

For incompatible materials - refer to Section 7 - Handling and Storage.

ALLYL ALCOHOL

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

- Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.
- Swallowing of the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis; serious consequences may result. (ICSC13733).
- Overexposure to non-ring alcohols causes nervous system symptoms. These include headache, muscle weakness and inco-ordination, giddiness, confusion, delirium and coma. Digestive symptoms may include nausea, vomiting and diarrhoea. Aspiration is much more dangerous than ingestion because lung damage can occur and the substance is absorbed into the body. Alcohols with ring structures and secondary and tertiary alcohols cause more severe symptoms, as do heavier alcohols.

EYE

- There is evidence that material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Severe inflammation may be expected with pain. There may be damage to the cornea. Unless treatment is prompt and adequate there may be permanent loss of vision. Conjunctivitis can occur following repeated exposure.
- Allyl alcohol vapour/liquid is a potent lachrymator and may be accompanied by complaints of photophobia, pain in the eyeball and blurred vision. The onset of eye-irritation may be delayed for several hours.
- Irritation of the eyes may produce a heavy secretion of tears (lachrymation).

SKIN

- Skin contact with the material may produce toxic effects; systemic effects may result following absorption.
- This material can cause inflammation of the skin on contact in some persons.
- The material may accentuate any pre-existing dermatitis condition.
- Allyl alcohol liquid may produce first or second degree burns with blistering and superficial necrosis. Skin contact may lead to systemic (liver and kidney) damage.
- Most liquid alcohols appear to act as primary skin irritants in humans. Significant percutaneous absorption occurs in rabbits but not apparently in man.
- Open cuts, abraded or irritated skin should not be exposed to this material.
- Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

- Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may produce toxic effects.
- The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.
- Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by sleepiness, reduced alertness, loss of reflexes, lack of co-ordination, and vertigo.
- Allyl alcohol inhalation of vapour may lead to pulmonary oedema with slowly developing distress. Liver necrosis has been reported in experimental animals.
- Aliphatic alcohols with more than 3-carbons cause headache, dizziness, drowsiness, muscle weakness and delirium, central depression, coma, seizures and behavioural changes. Secondary respiratory depression and failure, as well as low blood pressure and irregular heart rhythms, may follow. Nausea and vomiting are seen, and liver and kidney damage is possible as well following massive exposures. Symptoms are more acute the more carbons there are in the alcohol.

CHRONIC HEALTH EFFECTS

- Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.
- There has been some concern that this material can cause cancer or mutations but there is not enough data to

continued...

ALLYL ALCOHOL

Section 11 - TOXICOLOGICAL INFORMATION

make an assessment.

Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

Based on experience with animal studies, there is a possibility that exposure to the material may result in toxic effects to the development of the foetus, at levels which do not cause significant toxic effects to the mother.

Repeated allyl alcohol inhalation exposure of rats to 40 ppm resulted in gasping, nasal discharge. Exposure at 7 ppm was associated with degenerative changes in the liver and kidneys consisting of hepatic swelling and focal necrosis, as well as necrosis of the convoluted renal tubules and proliferation of interstitial tissues. These changes were mild and reversible. The toxicity of allyl alcohol appears related to the ability of the renal tubules to metabolise the compound to acrolein.

Acrolein, released in vivo as a metabolite of cyclophosphamide, appears to be at least partially responsible for the teratogenicity and bladder toxicity of the drug. The possible formation of DNA-adducts leaves the question of potential allyl alcohol carcinogenicity in doubt, a question further complicated by the high acute toxicity of the alcohol.

TOXICITY AND IRRITATION

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY

Oral (rat) LD50: 64 mg/kg

Inhalation (man) LCLo: 1000 ppm/1h

Inhalation (rat) LC50: 76 ppm/8h

IRRITATION

Skin (rabbit): 10 mg (open)

Eye (human): 25 ppm - SEVERE

Eye (rabbit): 4.27 ug - SEVERE

■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production. Allyl alcohol:

Acute toxicity: Animal studies demonstrate that allyl alcohol appears to be oxidised readily in the liver, giving a variety of metabolic products, such as acrolein, acrylic acid, glycidaldehyde, and glyceraldehyde. Among these metabolites, the most reactive metabolite, acrolein may cause hepatotoxicity in the liver. The inhalation LC50 is 140-150 mg/m³ for 8 hours exposure in rats. The dermal LD50 (rabbit) is 89 mg/kg bw. The oral LD50 values are 70 and 99-105 in rats, 96 in mice and 71 mg/kg bw in rabbits. The intraperitoneal LD50 values are 37 and 42 in rats, and 60 mg/kg bw in mice. A 55-year old man died within 100 minutes of oral ingestion of allyl alcohol. The amount ingested was assumed to be 212 g of allyl alcohol at the maximum. Death was attributed to acrolein-induced cardiotoxicity.

Allyl alcohol is considered to be slightly irritating to the skin and irritating to eyes in animals. Moreover, allyl alcohol may cause irritation of the eye and nasal mucosa in humans. allyl alcohol is considered not to be a skin sensitiser in guinea pigs [OECD TG 406].

Repeat dose toxicity: In a repeat dose inhalation toxicity study, male rats were exposed to allyl alcohol at nominal concentrations of 0, 2.4, 4.7, 12, 47, 95, 142, 237 or 355 mg/m³ for 7 hours/day, 5 days/week for 12 weeks. Histopathology showed that there was slight congestion of the lungs and liver at the dose of 355 mg/m³ (150 ppm). The NOAEL for inhalation toxicity in male rats is 12 mg/m³ (5 ppm) based on a significant decrease in body weight gain in groups exposed to 47 mg/m³ (20 ppm) and higher.

In a repeated dose oral toxicity study, allyl alcohol had adverse effects on kidney tissues in rats, administered in the drinking water continuously for 15 weeks at or above a level of 100 ppm (8.3 mg/kg bw/day in males and 6.9 mg/kg bw/day in females). The NOAEL was 50 ppm of allyl alcohol in drinking water (equivalent to 4.8 mg/kg bw/day in male rats and 6.2 mg/kg bw/day in female rats) based on adverse effects on kidney tissues (increases in absolute kidney weight and relative kidney weight) for females and on an increase in relative stomach weight for male and females at 100 ppm.

Genotoxicity: The in vitro studies, including reverse mutation assays in bacteria (S. Typhimurium: positive

continued...

ALLYL ALCOHOL

Section 11 - TOXICOLOGICAL INFORMATION

in T1535 with S9, TA100 without S9; negative in TA97, TA98, TA100 and TA1535 without S9), microbial forward mutation and fungal point mutation assays (*Streptomyces coelicolor* and *Aspergillus nidulans*, respectively: negative) and gene mutation in mammalian cells (V79 cells: positive) gave conflicting results, while the in vivo studies concerning micronucleus and the dominant lethal assay in rodents gave negative results. Based on these data in vitro and in vivo, there is equivocal evidence that allyl alcohol may be genotoxic.

Carcinogenicity: A carcinogenicity study was conducted with male and female Fischer 344 rats via drinking water (300 mg/L, total dose of 3.2 g) for 106 weeks, followed by observation until natural death (123-132 weeks). The study gave no clear evidence of carcinogenicity in male rats, but there was equivocal evidence of carcinogenicity in the liver of female rats.

Reproductive/developmental toxicity was studied in SD rats by gavage at doses of 0, 2, 8 or 40 mg/kg bw/day [OECD TG 421]. Males were dosed from 14 days before mating for total of 42 days, and females were dosed from 14 days before mating throughout the mating and pregnancy period to day 3 of lactation. The autopsy was conducted on the day after the final administration. No deaths were found in any group. Clinical findings in parental animals at 40 mg/kg bw/day were salivation, decrease in locomotor activity, irregular respiration (male and female), lacrimation and loose stool (male). Histopathological examinations at 40 mg/kg bw/day revealed atrophy of the thymus and hyperplasia of luteal cells in the ovary in females, necrosis, fibrosis, proliferation of bile duct, hypertrophy, and brown pigment deposition in peribiliary hepatocytes, and diffuse clear cell changes in males and females, and hyperplasia of squamous epithelium in the forestomach in males. In male rats, no changes in histopathological findings or weight of the testes and epididymis were found. In females, extension of mean oestrous cycle length and increase in females with irregular oestrous cycle were observed at 40 mg/kg/day group. There were no adverse effects on the other reproductive performance parameters (such as the mating index, fertility index, numbers of corpora lutea or implantations, implantation index, delivery index, gestation index, gestation length, parturition or maternal behaviour). In examination of offspring, decrease in viability index on day 4 and total litter loss (from one dam) were observed at 40 mg/kg bw/day group. There were no treatment-related findings in the external appearance, general conditions and necropsy findings in the offspring.

The NOAEL is considered to be 8 mg/kg bw/day for general toxicity and reproductive/developmental toxicity. In a prenatal developmental study conducted in SD rats, allyl alcohol was administered by gavage at doses of 0, 10, 35, or 50 mg/kg bw/day to pregnant rats on gestation days 9 -19 [OECD TG 414]. At doses of 10 mg/kg bw/day and higher significant toxicity in dams was observed. Maternal toxicities at 35 and 50 mg/kg bw/day were mortalities, clinical findings, reductions in body weight gain and feed consumption, macroscopic liver findings and increased liver weights. One female at 10 mg/kg bw/day also had macroscopic liver findings. An increased frequency of total litter loss was observed at 35 and 50 mg/kg bw/day dose levels. In case of total litter loss, severe toxicities were observed in the dam (loss of body weight, severe decreases in feed consumption, and evidence of significant liver toxicity). Despite the severe maternal toxicity observed, there were no allyl alcohol related increases in malformation rates or incidence of variations. allyl alcohol had no effects on intrauterine growth or survival in the fetuses from dams that survived to necropsy. Therefore, 10 mg/kg bw/day was considered to be the LOAEL for maternal toxicity, based on liver findings, and 10 mg/kg bw/day was considered to be the NOAEL for developmental toxicity, based on an increased frequency of total litter loss at 35 and 50 mg/kg bw/day, when allyl alcohol was administered orally by gavage to pregnant rats.

The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

SKIN

allyl alcohol	Australia Exposure Standards - Skin	Notes	Sk
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Section 12 - ECOLOGICAL INFORMATION

allyl alcohol 96 hr LC50 (0.32) mg/L Fathead minnow Fish Source: Experimental

Refer to data for ingredients, which follows:

ALLYL ALCOHOL:

■ log Pow (Verschuereen 1983):	0.17
■ Half- life Soil - High (hours):	168

continued...

ALLYL ALCOHOL

Section 12 - ECOLOGICAL INFORMATION

■ Half- life Soil - Low (hours):	24
■ Half- life Air - High (hours):	22
■ Half- life Air - Low (hours):	2.2
■ Half- life Surface water - High (hours):	168
■ Half- life Surface water - Low (hours):	24
■ Half- life Ground water - High (hours):	336
■ Half- life Ground water - Low (hours):	48
■ Aqueous biodegradation - Aerobic - High (hours):	168
■ Aqueous biodegradation - Aerobic - Low (hours):	24
■ Aqueous biodegradation - Anaerobic - High (hours):	672
■ Aqueous biodegradation - Anaerobic - Low (hours):	96
■ Aqueous biodegradation - Removal secondary treatment - High (hours):	73%
■ Photooxidation half- life water - High (hours):	3.50E+05
■ Photooxidation half- life water - Low (hours):	8020
■ Photooxidation half- life air - High (hours):	22
■ Photooxidation half- life air - Low (hours):	2.2

■ Very toxic to aquatic organisms.

■ Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters. Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

■ For allyl alcohol:

log Kow: -0.25- 0.17

Half-life (hr) air: 6.03

Henry's atm m³/mol: 4.90E-06

BOD 5 1.66,9.1%

COD: 2.1

ThOD: 2.2

Degradation Biological: significant

processes Abiotic: photo ox by uv in H₂O

Environmental fate:

Allyl alcohol is not expected to be hydrolyzed under normal environmental conditions. Indirect photo-oxidation by hydroxy radicals in the atmosphere is predicted to occur with a half-life of 4.32 hours. Allyl alcohol is readily biodegradable under aerobic conditions within 14 days (BOD = 86 %). The estimated BCF is 3.2 and there is low potential for bioaccumulation. Fugacity Model Mackay level III calculations indicate that allyl alcohol will be distributed mainly to air (67.6 %) water (25.1 %) and soil (7.3 %) compartment if released to air, while allyl alcohol will stay exclusively in the water compartment (99.7 %) if released to water. If released to soil, allyl alcohol will be distributed mainly to the water (19.4 %) and soil (80.4 %) compartment. If released simultaneously to air, soil and water, allyl alcohol will be distributed mainly to water (62.1 %) and soil (36.7 %) compartment. Henry's Law constant is 4.99×10^{-6} atm.m³/mole.

Terrestrial Fate: Residue disappearance and leaching of ¹⁴C-allyl alcohol from difference soils was studied in laboratory experiments. Residue disappearance is rapid (approx 90% in 10 days) and leaching of the chemical was fairly rapid (80-90% leached from soil column in 2 days) and was correlated negatively to the organic matter content. Volatilization and direct photolysis are not expected to be significant.

Aquatic Fate: The most likely fate of allyl alcohol is expected to be biodegradation. Volatilization, direct photolysis, and photooxidation are all expected to be slow processes.

Atmospheric Fate: Using a 2nd-order rate constant of 25.9 cm³/molecule-sec and an average hydroxyl radical concentration of 5×10^{-5} molecules/cm³, a pseudo first-order rate constant of 1.3×10^{-5} sec⁻¹ can be estimated. From this value, a half-life of 14.7 hr can be estimated. Using the Fate of Atmospheric Pollutants portion of GEMS, a half-life for the reaction of allyl alcohol with photochemically generated hydroxyl radicals of 6.03 hr was estimated. The predominant fate of allyl alcohol in the atmosphere is therefore expected to be reaction with hydroxyl radicals. Due to the miscibility of allyl alcohol with water, rain-out may also occur. Direct photolysis is not expected to be important, as allyl alcohol should not absorb significant amounts of radiation at >290 nm.

Ecotoxicity:

Fish LC₅₀ (96 h): Medaka 0.59 mg/l [OECD TG 203]; fathead minnow 0.32 mg/L

Daphnia magna EC₅₀ (48 h): 2.1 mg/ l [OECD TG 202].

Daphnia magna NOEC (21 d): 0.92 mg/L [OECD TG 211

Polychaete (Ophryotrocha diadema LC₅₀ (48 h): 0.33-1.0 mg/ L.

continued...

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Section 12 - ECOLOGICAL INFORMATION

Pseudokirchneriella subcapitata EC50 (72 h): 0.93 mg/L (for growth rate and biomass) [OECD TG 201].

■ DO NOT discharge into sewer or waterways.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
allyl alcohol	LOW	LOW	LOW	HIGH

GESAMP/EHS COMPOSITE LIST - GESAMP Hazard Profiles

Name / Cas No / RTECS No	EHS	TRN	A1a	A1b	A1	A2	B1	B2	C1	C2	C3	D1	D2	D3	E1	E2	E3
- CAS:107- 18- 6 / BA5075000	28	105	0	0	0	R	4	NI	2	3	4	2	3	A		D	3

Legend:

EHS=EHS Number (EHS=GESAMP Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships) NRT=Net Register Tonnage, A1a=Bioaccumulation log Pow, A1b=Bioaccumulation BCF, A1=Bioaccumulation, A2=Biodegradation, B1=Acute aquatic toxicity LC/EC50 (mg/l), B2=Chronic aquatic toxicity NOEC (mg/l), C1=Acute mammalian oral toxicity LD50 (mg/kg), C2=Acute mammalian dermal toxicity LD50 (mg/kg), C3=Acute mammalian inhalation toxicity LC50 (mg/kg), D1=Skin irritation & corrosion, D2=Eye irritation & corrosion, D3=Long-term health effects, E1=Tainting, E2=Physical effects on wildlife & benthic habitats, E3=Interference with coastal amenities,

For column A2: R=Readily biodegradable, NR=Not readily biodegradable.

For column D3: C=Carcinogen, M=Mutagenic, R=Reprotoxic, S=Sensitising, A=Aspiration hazard, T=Target organ systemic toxicity, L=Lung injury, N=Neurotoxic, I=Immunotoxic.

For column E1: NT=Not tainting (tested), T=Tainting test positive.

For column E2: Fp=Persistent floater, F=Floater, S=Sinking substances.

The numerical scales start from 0 (no hazard), while higher numbers reflect increasing hazard.

(GESAMP/EHS Composite List of Hazard Profiles - Hazard evaluation of substances transported by ships)

Section 13 - DISPOSAL CONSIDERATIONS

• Containers may still present a chemical hazard/ danger when empty.

• Return to supplier for reuse/ recycling if possible.

Otherwise:

• If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.

• Where possible retain label warnings and MSDS and observe all notices pertaining to the product.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

• Reduction,

• Reuse

• Recycling

• Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

continued...

ALLYL ALCOHOL

Section 13 - DISPOSAL CONSIDERATIONS

- DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- Recycle wherever possible.
- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
- Dispose of by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or Incineration in a licenced apparatus (after admixture with suitable combustible material).
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

Section 14 - TRANSPORTATION INFORMATION



Labels Required: TOXIC, FLAMMABLE LIQUID

HAZCHEM:

- ☐ *2WE Use alcohol resistant foam

Land Transport UNDG:

Class or division: 6.1
UN No.: 1098
Shipping Name: ALLYL ALCOHOL

Subsidiary risk: 3
UN packing group: I

Air Transport IATA:

ICAO/IATA Class: 6.1 (3)
UN/ID Number: 1098
Special provisions: None
Cargo Only
Packing Instructions: Forbidden
Passenger and Cargo
Packing Instructions: Forbidden
Passenger and Cargo
Limited Quantity
Packing Instructions: -
Shipping Name: ALLYL ALCOHOL

ICAO/IATA Subrisk: None
Packing Group: -
Maximum Qty/Pack: Forbidden
Passenger and Cargo
Maximum Qty/Pack: Forbidden
Passenger and Cargo
Limited Quantity
Maximum Qty/Pack: -

Maritime Transport IMDG:

IMDG Class: 6.1
UN Number: 1098
EMS Number: F- E, S- D
Limited Quantities: None
Shipping Name: ALLYL ALCOHOL

IMDG Subrisk: 3
Packing Group: I
Special provisions: None

GESAMP hazard profiles for this material can be found in section 12 of the MSDS.

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Section 15 - REGULATORY INFORMATION

REGULATIONS

allyl alcohol (CAS: 107-18-6) is found on the following regulatory lists;

"Australia - Queensland Hazardous Materials and Prescribed Quantities for Major Hazard Facilities", "Australia Exposure Standards", "Australia Hazardous Substances", "Australia Inventory of Chemical Substances (AICS)", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix J (Part 2)", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 7", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "International Council of Chemical Associations (ICCA) - High Production Volume List", "OECD Representative List of High Production Volume (HPV) Chemicals"

Section 16 - OTHER INFORMATION

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

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