



MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name Allyl Alcohol
Revision date 03-21-2010
CAS # 107-18-6
MSDS Number OC-1001 NA
Product use Allyl Diglycol Carbonate, Allyl Glycidyl Ether, Allyl ester monomer, Allyl alcoxyletes, other
Manufacturer/Supplier SHOWA DENKO K.K.
Organic Chemicals Department, Petrochemicals Division
13-9, Shiba Daimon 1-Chome, Minato-Ku, Tokyo 105-8518 Japan
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2. Hazards Identification

Physical state Liquid.
Appearance Transparent liquid
Emergency overview DANGER! Flammable liquid and vapor. May be fatal if absorbed through skin. Harmful if inhaled or swallowed. Causes severe eye irritation. Causes skin irritation. Causes respiratory tract irritation. May cause damage to the liver.

Potential health effects

Eyes Causes severe eye irritation. Lachrymation (discharge of tears).
Skin May be fatal if absorbed through skin. Causes skin irritation. Skin absorption can lead to serious systemic injury (periportal necrosis and congestion in the liver, hematuria, nephritis).
Inhalation Harmful if inhaled. Causes respiratory tract irritation. Vapors may cause drowsiness and dizziness.
Ingestion Harmful if swallowed. Swallowing or vomiting of the liquid may result in aspiration into the lungs.

Target organs Eyes. Skin. Respiratory system. Liver. Kidneys.
Chronic effects May cause damage to the liver and kidneys.
Signs and symptoms Irritation.
Potential environmental effects Very toxic to aquatic organisms.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Allyl alcohol	107-18-6	> 99

4. First Aid Measures

First aid procedures

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove any contact lenses and open eyes wide apart. Get medical attention immediately. Continue to rinse.

Skin contact Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Get immediate medical attention if symptoms occur after washing.

Inhalation Move injured person into fresh air and keep person calm under observation. Get medical attention if any discomfort continues.

Ingestion Rinse mouth thoroughly with water and give large amounts of milk or water, if person is conscious. Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs. Lay on the side. Get medical attention immediately.

Notes to physician Symptoms may be delayed.

General advice Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim warm. If breathing is difficult, give oxygen.

5. Fire Fighting Measures

Flammable properties	The product is flammable, and heating may generate vapours which may form explosive vapour/air mixtures. During fire, gases hazardous to health may be formed.
Extinguishing media	
Suitable extinguishing media	Carbon dioxide, alcohol-resistant foam, dry chemical, water spray, or water fog.
Unsuitable extinguishing media	No restrictions known.
Protection of firefighters	
Protective equipment and precautions for firefighters	Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials. Containers close to fire should be removed or cooled with water.
Hazardous combustion products	Carbon monoxide.

6. Accidental Release Measures

Personal precautions	Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Ventilate the area. Avoid inhalation of vapors and contact with skin and eyes. Wear suitable protective clothing. See Section 8 of the MSDS for Personal Protective Equipment.
Environmental precautions	Do not allow to enter drains, sewers or watercourses.
Methods for cleaning up	Remove sources of ignition. Absorb spillage with non-combustible, absorbent material. Containers with collected spillage must be properly labeled with correct contents and hazard symbol. For waste disposal, see Section 13 of the MSDS. Large Spills: Stop the flow of material, if this is without risk. Vapors can be contained by covering the spill with foam or sheeting. Absorb with inert absorbent such as dry clay, sand or diatomaceous earth, commercial sorbents, or recover using pumps. Use clean non-sparking tools to collect absorbed material. Wash contact areas with soap and water.

7. Handling and Storage

Handling	Local exhaust is recommended. Avoid inhalation of spray mist and contact with skin and eyes. Wear approved safety goggles. Wear protective gloves and appropriate clothing to prevent skin contact. The product is flammable, and heating may generate vapors which may form explosive vapor/air mixtures. Vapors are heavier than air and may travel along the floor and in the bottom of containers. Do not smoke or use open fire or other sources of ignition. Ground container and transfer equipment to eliminate static electric sparks. Observe good industrial hygiene practices.
Storage	Follow rules for flammable liquids. Do not store near heat sources or expose to high temperatures. Keep away from heat, sparks and open flame. Keep container tightly closed in a cool, well-ventilated place. Keep under nitrogen. Store away from incompatible materials.

8. Exposure Controls / Personal Protection

Occupational exposure limits

ACGIH

Material

Allyl alcohol (107-18-6)

Type

TWA

Value

0.5 ppm

U.S. - OSHA

Material

Allyl alcohol (107-18-6)

Type

PEL

Value

2 ppm
5 mg/m³

Canada - Alberta

Material

Allyl alcohol (107-18-6)

Type

TWA

Value

0.5 ppm
1.2 mg/m³

Canada - British Columbia

Material

Allyl alcohol (107-18-6)

Type

TWA

Value

0.5 ppm

Canada - Ontario

Material	Type	Value
Allyl alcohol (107-18-6)	TWA	0.5 ppm

Canada - Quebec

Material	Type	Value
Allyl alcohol (107-18-6)	STEL	9.5 mg/m ³
		4 ppm
	TWA	4.8 mg/m ³
		2 ppm

Mexico

Material	Type	Value
Allyl alcohol (107-18-6)	STEL	10 mg/m ³
		4 ppm
	TWA	5 mg/m ³
		2 ppm

Engineering controls Use explosion-proof equipment. Should be handled in closed systems, if possible. Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of vapors. Provide easy access to water supply and eye wash facilities.

Personal protective equipment

Eye / face protection Chemical goggles and face shield are recommended.

Skin protection Wear appropriate chemical resistant clothing to prevent any possibility of skin contact. Wear protective gloves. Nitrile rubber. Be aware that the liquid may penetrate the gloves. Frequent change is advisable. Suitable gloves can be recommended by the glove supplier.

Respiratory protection If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Use an organic vapor respirator for concentrations exceeding the Occupational Exposure Limit.

General hygiene considerations 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.

9. Physical & Chemical Properties

Appearance	Transparent liquid
Color	Colorless.
Odor	Pungent.
Odor threshold	Not available.
Physical state	Liquid.
Form	Liquid.
pH	Not available.
Melting point	-200.2 °F (-129 °C)
Freezing point	-200.2 °F (-129 °C)
Boiling point	206.4 °F (96.9 °C)
Flash point	70.7 °F (21.5 °C) Tag Closed Cup
Evaporation rate	Not available.
Flammability (Heat of combustion)	1.85 kJ/mol
Flammability	Not available.
Flammability limits in air, upper, % by volume	18 % v/v
Flammability limits in air, lower, % by volume	2.5 % v/v
Vapor pressure	2.4 kPa (20°C)
Vapor density	2 (Air=1)
Specific gravity	0.854 (20/4°C)

Solubility (water)	Completely soluble in water.
Partition coefficient (n-octanol/water)	0.17 log Pow
Auto-ignition temperature	829.4 °F (443 °C)
Decomposition temperature	Not available.
VOC	100 %
Viscosity	1.34 mPa-s @ 68 °F (20 °C)
Density	0.854 g/cm ³
Percent volatile	100 %
Molecular weight	58.08 g/mol
Molecular formula	C ₃ H ₆ O

10. Chemical Stability & Reactivity Information

Chemical stability	Stable at normal conditions. Allyl alcohol can be oxidized under influence of (air)-oxygen to acrolein. Acrolein can react with allyl alcohol and form acrolein diallyl acetal. Allyl alcohol, having an unsaturated bond and a hydroxyl group, undergoes addition to the olefinic double bond and substitution of the hydroxyl group. Exothermic reaction with: Sodium hydroxide, Fluorine, Alkali metals, Hydrogen peroxide. Risk of explosion with: Alkali salts and alkaline earth compounds (chlorates), Sulfuric acid.
Conditions to avoid	Keep away from heat, sparks and open flame.
Incompatible materials	Alkalies. Acids. Ammonia. Phenol. Alcohols. Metal halides. Aluminum. Metal oxides. Zinc. Tin. Oxidizing agents.
Hazardous decomposition products	Carbon monoxide.
Possibility of hazardous reactions	Will not occur.

11. Toxicological Information

Toxicological data

Product

Allyl alcohol (107-18-6)

Test Results

Acute Dermal LD50 Rabbit: 45 mg/kg
 Acute Inhalation LC50 Rat: 1060 ppm 1 Hours
 Acute Inhalation LC50 Rat: 165 ppm 4 Hours
 Acute Inhalation LC50 Rat: 76 ppm 8 Hours
 Acute Inhalation LDLO Monkey: 1000 ppm 4 hours
 Acute Oral LD50 Mouse: 96 g/kg
 Acute Oral LD50 Rabbit: 71 mg/kg
 Acute Oral LD50 Rat: 99 - 105 mg/kg
 Acute Oral LD50 Rat: 70 mg/kg
 Acute Oral LD50 Rat: 64 mg/kg
 Acute Oral LDLO Human: 0.43 mg/l

Acute effects	May be fatal if absorbed through skin. Causes severe eye irritation. Causes skin irritation. Skin absorption can lead to serious systemic injury (periportal necrosis and congestion in the liver, hematuria, nephritis). Harmful by inhalation and if swallowed. Causes respiratory tract irritation. Aspiration hazard: Swallowing or vomiting of the liquid may result in aspiration into the lungs. May cause damage to the liver.
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Local effects	Lachrymation (discharge of tears).
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US ACGIH Threshold Limit Values: Skin designation

Allyl alcohol (CAS 107-18-6)

Can be absorbed through the skin.

Sensitization	Not a skin sensitizer.
Chronic effects	May cause damage to the liver and kidneys.
Carcinogenicity	Not classified.

ACGIH Carcinogens

Allyl alcohol (CAS 107-18-6)

A4 Not classifiable as a human carcinogen.

Mutagenicity Not classified.

Reproductive effects Not classified.

12. Ecological Information

Ecotoxicological data

Product

Allyl alcohol (107-18-6)

Test Results

EC50 Algae: 2.6 mg/l 72 Hours

EC50 Algae: 7.8 mg/l 72 Hours

EC50 Algae: 2.3 mg/l 72 Hours

EC50 Algae: 5.4 mg/l 72 Hours

EC50 Algae: 6.1 mg/l 72 Hours

EC50 Algae: \geq 10 mg/l 72 Hours

EC50 Daphnia: 2.1 mg/l 48 Hours

LC50 Daphnia: 0.25 mg/l 96 Hours

LC50 Fathead minnow (Pimephales promelas): 0.32 mg/l 96 Hours

LC50 Goldfish (Carassius auratus): 1 mg/l 24 Hours

LC50 Oryzias latipes: 0.59 mg/l 96 Hours

NOEC Daphnia: 0.92 mg/l 21 days

Ecotoxicity Very toxic to aquatic organisms.

Persistence and degradability The product is readily biodegradable. BOD5: 1.79 g/g. COD: 2.12 g/g.

Bioaccumulation / Accumulation Not expected to bioaccumulate on the basis of the low octanol-water partition coefficient.

Partition coefficient (n-octanol/water) 0.17 log Pow

Mobility in environmental media The product is water soluble and may spread in water systems.

13. Disposal Considerations

Waste codes D001: Waste Flammable material with a flash point <140 °F

Disposal instructions Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

Waste from residues / unused products Disposal recommendations are based on uncontaminated material.

14. Transport Information

DOT

Basic shipping requirements:

UN number UN1098
Proper shipping name Allyl alcohol
Hazard class 6.1
Subsidiary hazard class 3
Packing group Labels required Additional information: I
6.1, 3
ERG number 131

IATA

Basic shipping requirements:

UN number 1098
Proper shipping name Allyl alcohol
Hazard class 6.1
Subsidiary hazard class 3

IMDG

Basic shipping requirements:

UN number 1098
Proper shipping name ALLYL ALCOHOL
Hazard class 6.1
Subsidiary hazard class 3
Packing group I
Environmental hazards
Marine pollutant Yes
EmS No. F-E, S-D

TDG

Basic shipping requirements:

Proper shipping name ALLYL ALCOHOL
Hazard class 6.1
UN number UN1098
Packing group I



DOT



IATA



IMDG



TDG

15. Regulatory Information

US federal regulations

US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Spill: Reportable quantity

Allyl alcohol (CAS 107-18-6) 100 LBS

US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Substance: Threshold Planning Quantity

Allyl alcohol (CAS 107-18-6) 1000 LBS

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

Allyl alcohol (CAS 107-18-6) 1.0 %

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

Allyl alcohol (CAS 107-18-6) Listed.

CERCLA (Superfund) reportable quantity (lbs)

Allyl alcohol 100

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

Section 302 extremely hazardous substance Yes

Section 311 hazardous chemical	Yes
Clean Water Act (CWA)	Hazardous substance
Drug Enforcement Agency (DEA)	Not controlled
WHMIS status	Controlled
WHMIS classification	B2 - Flammable/Combustible D1A - Immediate/Serious-VERY TOXIC D2B - Other Toxic Effects-TOXIC

WHMIS labeling



Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations

US - California Hazardous Substances (Director's): Listed substance

Allyl alcohol (CAS 107-18-6) Listed.

US - Massachusetts RTK - Substance: Listed substance

Allyl alcohol (CAS 107-18-6) Listed.

US - New Jersey Community RTK (EHS Survey): Reportable threshold

Allyl alcohol (CAS 107-18-6) 500 LBS

US - New Jersey RTK - Substances: Listed substance

Allyl alcohol (CAS 107-18-6) Listed.

US - Pennsylvania RTK - Hazardous Substances: Listed substance

Allyl alcohol (CAS 107-18-6) Listed.

16. Other Information

Further information EINECS No: 203-470-7

HMIS® ratings Health: 3*
Flammability: 3
Physical hazard: 1

NFPA ratings Health: 4
Flammability: 3
Instability: 1

Disclaimer The information in this MSDS was obtained from sources which we believe are reliable, but no warranty or representation as to its accuracy or completeness is hereby given. Users should consider the information herein only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal, the safety and health of employees and customers and the protection of the environment.

Issue date 07-21-2010

This data sheet contains changes from the previous version in section(s):

First Aid Measures: General advice
Disposal Considerations: Waste codes
Other Information: Further information