SHOWA DENKO K.K.

GPS/JIPS Safety Summary

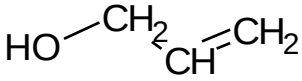
1. SUBSTANCE NAME

Allyl alcohol （CAS No. 107-18-6）

2. GENERAL STATEMENT

Allyl alcohol has a highly reactive allyl group and is used in various reactions and polymerization reactions. It is used as a raw material for allyl glycidyl ether, which is used as a silane coupling agent (improvement agent such as paint and dye); as a raw material for epichlorohydrin, which is a raw material for epoxy resin; and as a raw material for drugs, fragrance, etc. Allyl alcohol is freely soluble in water and is a clear, colorless liquid, having a strong pungent odor at ordinary temperature. Although it does not polymerize under normal storage conditions, it may polymerize or be heated by reacting with oxygen in the air to produce acrolein. Since it is highly flammable, fire is strictly prohibited. Avoid sunlight, and store tightly closed in a well-ventilated place.
It is highly toxic and may be life threatening when inhaled or comes into contact with the skin. It irritates the skin and strongly irritates the eyes. If swallowed or inhaled, it also causes damage to organs (lung, liver, and kidney), or it may cause damage to organs (liver, lung, and stomach) through prolonged or repeated exposure. Thus, it is necessary to wear appropriate protective equipment in a well-ventilated place to protect the eyes and skin and prevent inhalation.
It is suggested to be very toxic to aquatic life. To minimize the impact on the environment, take measures to prevent leakage.

3. CHEMICAL IDENTITY

Item	Description
Chemical or generic name	Allyl alcohol
Trade name	Allyl alcohol
Synonyms	Propenyl alcohol; 2-Propene-1-ol; 3-Hydroxypropene; AAL
CAS No.	107-18-6
Other No.	Japan: Chemical Substances Control Law (2)-260
Chemical Formula	C_3H_6O
Structural formula	
Source/References	Section 3 of the SDS issued by SHOWA DENKO K.K.

4. USES AND APPLICATIONS

Main uses	It is commonly used as raw materials for epichlorohydrin, allyl glycidyl ether, resin additives, and flame retardants as well as raw materials in fragrance and intermediates of pharmaceuticals and agricultural chemicals.

5. PHYSICAL/CHEMICAL PROPERTIES

Appearance	Liquid
Colour	Colourless,clear
Odour	Strong, irritating
Melting point/Boiling point	−129 ℃ / 97.0 ℃ (at 1013.25 hPa)
Flash point	21 ℃ (Closed cup)
Flammability (solid, gas)	Highly flammable liquid and vapour.
Explosive limits (vol %)	2.5 – 18.0 vol %
Auto-ignition temperature	443 ℃
Vapour pressure	25 hPa (at 20 ℃)
Relative vapour density at 20 ° C	2 (Air=1)
Relative density	0.854 (at 20 ℃/4 ℃)
Density	0.8540 g/cm^3 (at 20 ℃)
Solubility	Miscible with water
Partition coefficient n-octanol/water (Log Pow)	0.17
Sources/references	Section 9 and 10 of the SDS issued by SHOWA DENKO K.K.

6. HEALTH EFFECTS

Effect assessment	Results （GHS Hazard Classification）
Acute toxicity (oral)	Category 3 Toxic if swallowed.
Acute toxicity (dermal)	Category 2 Fatal in contact with skin
Acute toxicity (inhalation: gas)	Classification not possible （No data available）
Acute toxicity (inhalation: vapours)	Category 2 Fatal if inhaled.
Acute toxicity (inhalation: dust, mist)	Classification not possible （Lack of data）
Skin corrosion/irritation	Category 2 Causes skin irritation.
Serious eye damage/eye irritation,	Category 2A Causes serious eye irritation.
Respiratory sensitisation	Classification not possible （No data available）
Skin sensitisation	Not classified
Germ cell mutagenicity	Classification not possible （Lack of data）
Carcinogenicity	Classification not possible （Lack of data）
Reproductive toxicity	Category 2 Suspected of damaging fertility or the unborn child.
Specific target organ toxicity — Single exposure,	Category 1 (lungs, liver, kidneys) Causes damage to organs
Specific target organ toxicity (repeated exposure)	Category 1 Causes damage to organs (liver, lungs, stomach) through prolonged or repeated exposure.
Aspiration hazard	Classification not possible （No data available）
Sources/references	Section 2 and 11 of SDS issued by SHOWA DENKO K.K.

・ GHS (Globally Harmonized System of Classification and Labelling of Chemicals): A system that classifies chemicals according to the type and degree of hazards, labels the information, and provides safety data sheets according to globally harmonized rules.

・ Not classified: Sufficient information has been obtained to implement the GHS classification, and as a result of the classification, it does not fall under any of the hazard categories specified in the GHS. It is considered to be a lower hazard.
・ Not applicable: Since the priority of physical state, chemical structure, chemical property, and hazard items used in the GHS classification procedures does not fall under the category, it is not subject to the classification for the category.
・ Classification not possible (No data available): Classification is not possible because there is no sufficiently reliable data to make judgment on GHS classification after examining various information sources and in-house data, etc.
・ Classification not possible (Lack of data): There is not enough information for GHS classification, and classification is not possible.

7. ENVIRONMENTAL EFFECTS

Effect assessment	Results (GHS Hazard Classification)
Hazardous to the aquatic environment, short-term (acute)	Category 1 Very toxic to aquatic life.
Hazardous to the aquatic environment, long-term (chronic)	Category 3 Harmful to aquatic life with long lasting effects.
Hazardous to the ozone layer	Classification not possible (No data available)
Sources/references	Sections 2 and 12 of the SDS issued by SHOWA DENKO K.K.

Environmental fate/dynamics	
Mobility in soil	Koc = 1.32
Persistence/degradability	Biodegradation test (14 days): Readily biodegradable
Bioaccumulation potential	BCF = 3.162 Accumulation is suggested to be low.
Conclusion about PBT/vPvB	The criteria for persistent bioaccumulative and toxic (PBT; remaining persistently in the environment and possessing high bioaccumulation potential and toxicity) and very persistent and very bioaccumulative (vPvB; remaining very persistently in the environment and possessing very high bioaccumulation potential) chemicals are believed to inapplicable.
Sources/references	Sections 12 of the SDS issued by SHOWA DENKO K.K.

8. EXPOSURE

Detals	Exposure potentials through main uses
Occupational exposures	The product is manufactured and used in closed/continuous process with controlled exposure, or used in synthesis or compounding operation in closed batches, but there is a potential for dermal or inhalation exposure in operators in case of maintenance, sampling, equipment failure, etc. (PROC2, 3). There is a potential for dermal or inhalation exposure in operators in association with dust/vapor/aerosol generation, spillage, cleaning of equipment, etc. in the absence of dedicated equipment, or in the transfer of substances or preparations to ships and large-capacity containers in dedicated equipment or in the transfer of substances or preparations to small-capacity containers under conditions designed to minimize spillage (PROC8a, 8b, 9). During the use of the reagent in a small test laboratory, there is a potential for dermal or inhalation exposure in operators (PROC15).
Consumer exposures	This product is not used directly by general consumers.

Environmental exposures	Since these products are typically manufactured and used in closed processes, the potential for release into the environment is limited.
Precautions	If there is a possibility of exposure in other uses, take appropriate measures with reference to recommended risk management measures.

9. RISK MANAGEMENT RECOMMENDATIONS

Recommended risk management measures can minimize risks to workers, consumers, and the environment from Section 8 exposure scenarios.

Detals	Risk management recommendations
Worker	Technical measures: For handling, use tightly closed equipment and device, or local exhaust ventilation as much as possible. Install facilities for eye and body washing near the handling place. Use explosion-proof electrical, ventilation, and lighting equipment.
	Local exhaust and general ventilation: Handle the product in local exhaust ventilation or in a place with general ventilation equipment.
	Permissible concentration: For the product, a permissible concentration of 1 ppm (2.4 mg/m3) (skin) has been published by the Japan Society for Occupational Health, and the time-weighted average (TLV-TWA) of 0.5 ppm (skin) has been published by the American Conference of Governmental Industrial Hygienists (ACGIH). Manage and control the concentration below these values.
	Protective equipment: During operation, use a certified gas mask for organic gas (collection rate 90% or higher), supplied air mask, and self-contained breathing apparatus as respiratory protection. Wear chemically resistant rubber gloves (protection efficiency 95%, neoprene gloves are recommended) as a protective equipment for hand. Note that nitrile rubber, polyvinyl alcohol (PVA), and polyvinyl chloride are not suitable protective materials. Use safety glasses and highly adhesive safety goggles as a protective equipment for the eyes. Wear chemically resistant protective clothing; protective gloves, apron, and boots; and face protection depending on the usage condition.
	Precautions The operation manager should educate operators about the selection of appropriate protective equipment, proper usage method, and control method of the work site.
Consumer	This product is not used directly by general consumers.
Environment	Install appropriate wastewater treatment facilities and exhaust gas treatment facilities. In addition, take measures to prevent leakage, and pay attention to periodic confirmation of discharge volume, daily control, and handling.
Special notes (emergency measures in case of leakage, etc.)	Precautions to human body, protective equipment, and emergency measures: During operation, wear appropriate protective clothing and gloves, eye and face protection, and, depending on the situation, respiratory protection to prevent inhalation, eye and face contact, and skin adhesion. In case of a massive leakage, immediately evacuate the

	surrounding personnel and ventilate the area. Prohibit unauthorized persons from entering the area where leakage occurred by using a rope to secure the area, and immediately remove ignition sources from the vicinity. In case of ignition, prepare suitable extinguishing equipment (carbon dioxide, alcohol-resistant foam, dry chemical, or water spray). Environmental precautions: Prevent spillage of product and contain it. Take care not to discharge the spilled product into rivers, etc., and affect the environment. Regarding a containment method, if the amount of spillage is small, absorb it with dry sand, soil, sawdust, waste cloth, etc., and recover it in a sealed, noncombustible, empty container. In case of a large amount of spillage, stop the flow with a souvenir, etc., keep it in a safe place, collect it in a noncombustible, sealable empty container as much as possible, and rinse the affected area with plenty of water.
Precautions	For normal handling, emergency response, disposal, and transportation control measures, refer to sections 4, 5, 6, 7, 8, 13, and 14 of the SDS issued by Showa Denko K.K.

10. STATE AGENCY REVIEW

Hazard assessment	Situations of review
International Chemical Safety Cards	ICSC: 0095 https://www.ilo.org/dyn/icsc/showcard.display?p_lang=en&p_card_id=0095&p_version=2
OECD HPV	https://hpvchemicals.oecd.org/UI/Search.aspx
REACH	https://echa.europa.eu/substance-information/-/substanceinfo/100.003.156

11. REGULATORY INFORMATION／GHS CLASSIFICATION AND LABELLING INFORMATION

When using the product outside Japan, it must be handled in accordance with applied laws and regulations in that country or territory.

Hazards	Classification results (hazard information)
Physical hazards	Flammable liquids, Category 2
Health hazards	Acute toxicity (oral), Category 3
	Acute toxicity (dermal), Category 2
	Acute toxicity (inhalation :vapours), Category 2
	Skin corrosion/irritation, Category 2
	Serious eye damage/eye irritation, Category 2A
	Reproductive toxicity, Category 2
	Specific target organ toxicity (single exposure), Category 1, lungs, liver, kidneys
	Specific target organ toxicity (repeated exposure), Category 1, liver, lungs, stomach
Environmental hazards	Hazardous to the aquatic environment, short-term (acute), Category 1
	Hazardous to the aquatic environment, long-term (chronic),

	Category 3

Labelling Information	
Hazard pictograms (GHS)	
Signal word (GHS)	Danger
Hazard statements (GHS)	Highly flammable liquid and vapour. (H225) Toxic if swallowed. (H301) Fatal in contact with skin. (H310) Fatal if inhaled. (H330) Causes skin irritation. (H315) Causes serious eye irritation. (H319) Suspected of damaging fertility or the unborn child. (H361) Causes damage to organs (lungs, liver, kidneys). (H370) Causes damage to organs (liver, lungs, stomach) through prolonged or repeated exposure. (H372) Very toxic to aquatic life. (H400) Harmful to aquatic life with long lasting effects. (H412)

12. CONTACT INFORMATION

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13. DATE OF ISSUE / REVISION, ADDITIONAL INFORMATION

Date of issue: December 27, 2022

Revisions:

Date of revision	Revised section	Revised item	Version
December 27, 2022	5, 11, 13	Update to the latest information	Rev.2

Special instructions: none

14. DISCLAIMER

The safety summary is part of the effort for the voluntary management of chemical substance in the chemical industry (GPS/JIPS: Japan Initiative of Product Stewardship). The purpose of the safety summary is to provide information on the safe handling of the product as an overview and not to provide professional information, such as the risk evaluation process and its impact on human health and the environment. This document is not meant to serve as an alternative to risk evaluation, such as a Safety Data Sheet (SDS) or a Chemical Safety Report (CSR). This safety summary is being written as accurately as possible based on data such as laws, materials, and information available at the time of publication, but it does not include all data. It does not guarantee anything.