SHOWA DENKO K.K.

GPS/JIPS Safety Summary

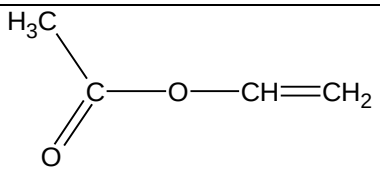
1. SUBSTANCE NAME

Vinyl acetate （CAS No. 108-05-4）

2. GENERAL STATEMENT

Vinyl acetate manufactured by our company is a highly reactive, colorless, clear liquid with a double bond in the same molecule and is used for organic synthetic raw materials, polyvinyl alcohol, emulsions, paint, etc.

3. CHEMICAL IDENTITY

Item	Description
Chemical or generic name	Vinyl acetate
Trade name	Vinyl acetate
Synonyms	Vinyl acetate monomer: VAM
CAS No.	108-05-4
Other No.	Japan: Chemical Substances Control Law (2)-728
Chemical Formula	$C_4H_6O_2$
Structual Formnula	
Source/References	Section 3 of the SDS issued by SHOWA DENKO K.K.

4. USES AND APPLICATIONS

Main uses	It is commonly used in vinyl acetate resin monomer, monomers for copolymerization with ethylene, styrene, acrylate, methacrylate, etc., polyvinyl alcohol, bonding agent, ethylene/vinyl acetate copolymers, synthetic fiber, gum-based material, etc. Our company products are used in organic synthetic raw materials, polyvinyl alcohols, emulsions, and paints.

5. PHYSICAL/CHEMICAL PROPERTIES

Vinyl acetate is a clear, colorless liquid at ordinary temperature, having a sweet, aromatic odor. A stabilizer (polymerization inhibitor) is added, but polymerization may begin due to light, etc. If no stabilizer (polymerization inhibitor) is added, it will polymerize rapidly in air. Also, it is extremely flammable, and when stored, the container should be sealed and tightly closed in a cool, well-ventilated place.

Appearance	Liquid
Colour	Colourless
Odour	aromatic odour
Melting point/Boiling point	-93.2 ℃ / 72.8 ℃
Flash point	-8 ℃ (Closed cup)

Flammability	Highly flammable liquid and vapor.
Explosive limits (vol %)	2.6 – 13.4 vol %
Auto-ignition temperature	402 ℃
Vapour pressure	120 hPa (at 20 ℃)
Density	0.930 – 0.934 g/cm^3 (at 20 ℃)
Solubility in water	23 g/L (at 20℃)
Partition coefficient n-octanol/water (Log Pow)	0.73
Other data	Specific heat capacity 1.76 × 10^3 J/kg ℃(20℃) [0.42 kcal/kg℃(20 ℃)] Heat of polymerization 8.92 × 10^4 J/mol [21.3 kcal/mol] Heat of combustion 2.07 × 10^6 J/mol [495 kcal/mol]
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 5 May be harmful if swallowed.
Acute toxicity (dermal)	Category 5 May be harmful in contact with skin.
Acute toxicity (inhalation:gas)	Not applicable.
Acute toxicity (inhalation:vapours)	Category 4 Harmful if inhaled.
Acute toxicity (inhalation:dust,mist)	Classification not possible. （No data available）
Skin corrosion/irritation	Category 2 Causes skin irritation.
Serious eye damage/eye irritation,	Category 2 Causes serious eye irritation.
Respiratory sensitisation	Classification not possible. （No data available）
Skin sensitisation	Classification not possible. （Lack of data）
Germ cell mutagenicity	Category 2 Suspected of causing genetic defects.
Carcinogenicity	Category 2 Suspected of causing cancer.
Reproductive toxicity	Classification not possible （Lack of data）
Specific target organ toxicity — Single exposure,	Category 3 (Narcosis) May cause drowsiness or dizziness.
Specific target organ toxicity — Single exposure,	Category 3 (Respiratory tract irritation) May cause respiratory irritation
Specific target organ toxicity (repeated exposure)	Category 2 (respiratory system) May cause damage to organs (respiratory system) through prolonged or repeated exposure.
Aspiration hazard	Classification not possible （No data available）
Referencese	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.
・ 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 2 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=6
Persistence/degradability	Biodegradation test (2 weeks): Readily biodegradable.
Bioaccumulation potential	BCF=3.16 Estimated as low bioaccumulation potential.
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	Although our company products are manufactured in closed, well-controlled, continuous processes, there is a potential for dermal or inhalation exposure to operators during operation, in case of maintenance, sampling, or equipment failures (PROC 2). During batch and other process operations, there is a potential for dermal and inhalation exposure to operators during maintenance, sampling, filling, emptying, and equipment failure (PROC 4). There is a potential for dermal and inhalation exposure in operators during blending/mixing operation in batches in the formulation and manufacture of articles (PROC 5). There is a potential for dermal or inhalation exposure in operators during the transfer of substances or preparations from a ship or large-capacity container in the dedicated facility, in association with dust/vapor/aerosol generation, spillage, cleaning of the equipment, etc. (PROC 8b).
Consumer exposures	Our company product is not used directly by general consumers. The vinyl acetate monomer remaining in the vinyl acetate resin may be exposed to the consumer.
Environmental exposures	Since our company products are typically manufactured and used in closed processes, their emission to the environment is limited. The

	material is a liquid with a high vapor pressure, and it may be released from its compounding process mainly into the atmospheric and water environment (ERC2). If released to the environment, it is likely to be distributed to and rapidly degrade in the atmosphere.
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 Handle with protective equipment. Use explosion-proof electrical, ventilation, and lighting equipment. Take action to prevent static discharge, which is an ignition source. Install facilities for eye and body washing near the handling place.
	Local exhaust and general ventilation In the manufacturing processes of closed system, perform maintenance sampling in a generally well-ventilated room. Use local exhaust ventilation when blending, mixing, and transferring this product.
	Permissible concentration For the product, the American Conference of Governmental Industrial Hygienists (ACGIH) has published the time-weighted average (TLV-TWA) of 10 ppm (35 mg/m3) and the short-term exposure limit (TLV-STEL) of 15 ppm (53 mg/m3). Manage and control the concentration below these values.
	Protective equipment During operation, wear respiratory protection (mask with a collection rate of 95% or higher) and rubber gloves (APF20 [protection rate 95%]) to avoid contact with the skin, and wear eye protection (safety goggles) or face shield to avoid eye irritation. In addition, use protective clothing, boots, and apron that have undergone electrostatic removal or antistatic treatment according to 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.
Enviaronment	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 Wear protective equipment during operation to prevent inhalation, eye or 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. Immediately remove ignition sources from the vicinity, and prepare suitable extinguishing media.
	Environmental precautions Take care not to discharge the leaked product into rivers, etc., and affect the environment.
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: 0347 https://www.ilo.org/dyn/icsc/showcard.display?p_lang=en&p_card_id=0347&p_version=2
OECD HPV	none
REACH	https://echa.europa.eu/substance-information/-/substanceinfo/100.003.224

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
	Self-reactive substances and mixtures, Type G
Health hazards	Acute toxicity (oral), Category 5
	Acute toxicity (dermal), Category 5
	Acute toxicity (inhalation:vapours), Category 4
	Skin corrosion/irritation, Category 2
	Serious eye damage/eye irritation, Category 2
	Germ cell mutagenicity, Category 2
	Carcinogenicity, Category 2
	Specific target organ toxicity (single exposure), Category 3, Narcosis
	Specific target organ toxicity (single exposure), Category 3, Respiratory tract irritation
	Specific target organ toxicity (repeated exposure), Category 2, respiratory system
Environmental hazards	Hazardous to the aquatic environment, short-term (acute), Category 2
	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) May be harmful if swallowed. (H303) May be harmful in contact with skin. (H313) Harmful if inhaled. (H332) Causes skin irritation (H315) Causes serious eye irritation (H319) Suspected of causing genetic defects. (H341) Suspected of causing cancer. (H351) May cause respiratory irritation. (H335) May cause drowsiness or dizziness. (H336) May cause damage to organs (respiratory system) through prolonged or repeated exposure. (H373) Toxic to aquatic life. (H401) 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	6, 10,13	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.