

SHOWA DENKO K.K.

GPS/JIPS Safety Summary



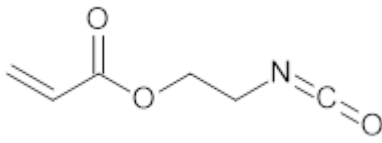
1. SUBSTANCE NAME

2-Isocyanatoethyl acrylate (CAS No. 13641-96-8)

2. GENERAL STATEMENT

2-Isocyanatoethyl acrylate manufactured by our company is a functional monomer characterized by the presence of polymerizable acrylic groups and isocyanate groups that can react with various active hydrogen compounds in the same molecule. Its high photopolymerization properties allow the product to be used in a wide variety of applications, including resists (liquid, film, and coloring resists), adhesives and bonding agents, printed versions, paints, and surface treatment agents. It is harmful to the human body and is life threatening if inhaled. It causes irritation to the skin and may cause allergic skin reaction. It also causes strong eye irritation. Therefore, it is necessary to wear protective equipment during use to protect the eyes and skin and prevent inhalation.

3. CHEMICAL IDENTITY

Item	Description
Chemical or generic name	2-Isocyanatoethyl acrylate
Trade name	Karenz™ AOI
CAS No.	13641-96-8
Chemical Formula	C ₆ H ₇ NO ₃
Structural Formula	
Source/References	Section 3 of the SDS issued by SHOWA DENKO K.K.

4. USES AND APPLICATIONS

Main uses	2-Isocyanatoethyl acrylate is used as a raw material for electronic materials (liquid resist, film resist, color filter resist, semiconductor tape, adhesive, bonding agent), printing (print plate, color calibration), medical care (soft contact lens, dental material), fiber/paper/wood (surface treatment agent), automobile (top coat, repair paint, part paint), home appliance (substrate, insulation material), and building materials (cement primer, paint, bonding agent).
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5. PHYSICAL/CHEMICAL PROPERTIES

2-Isocyanatoethyl methacrylate is a colorless to slightly yellow liquid, having a pungent odor. It is stable under normal use conditions, but it is polymerized by heat, light, etc. When storing, it is necessary to avoid sunlight and to store it in a cool and dark place to avoid polymerization.

Appearance	Liquid
Colour	Colourless, light yellow
Odour	Pungent
Melting point/Boiling point	-115 °C / 195 °C

Flash point	92 °C (Cleveland open style)
Vapour pressure	35.8 Pa (25°C)
Relative density	1.13 (23°C)
pH	Not applicable (insoluble in water)
Partition coefficient n-octanol/water (Log Pow)	1.6
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)	Classification not possible (No data available)
Acute toxicity (inhalation:gas)	Not applicable
Acute toxicity (inhalation:vapour)	Classification not possible (No data available)
Acute toxicity (inhalation:dust,mist)	Category 2 Fatal if inhaled
Skin corrosion/irritation	Category 1C Causes severe skin burns
Serious eye damage/eye irritation,	Category 1 Causes serious eye damage.
Respiratory sensitisation	Category 1 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitisation	Category 1 May cause an allergic skin reaction.
Germ cell mutagenicity	not classified
Carcinogenicity	Classification not possible (No data available)
Reproductive toxicity	Not classified
Specific target organ toxicity – Single exposure,	Not classified
Specific target organ toxicity (repeated exposure)	Not classified
Aspiration hazard	Classification not possible (No data available)
References	Section 2 and 11 of SDS issued by SHOWA DENKO K.K.
<ul style="list-style-type: none"> · 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 2 Toxic 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	log Koc=2
Persistence/degradability	Biodegradation test (28 days), Not readily biodegradable (%biodegradation: 45%) Biodegradation test (28 days), Inherently biodegradable (%biodegradation: 86.2%)
Bioaccumulation potential	log Pow=1.6 BCF=0.46 – 8.12 (zebrafish, 28 days) 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

Details	Exposure potentials through main uses
Occupational exposures	Exposure to this product occurs in manufacturing facilities and various industrial facilities that use the substance, but the exposure in operators is relatively low because all of them are in closed processes under controlled conditions; therefore, there is almost no possibility of atmospheric release of the product. However, inhalation and contact with the skin/eyes may occur during sampling, filling, and transfer operations.
Consumer exposures	This product is not used directly by general consumers.
Environmental exposures	Since our company 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.

Details	Risk management recommendations
Worker	Technical measures, local exhaust, and general ventilation Provide both local exhaust ventilation and general room ventilation equipment at the site of manufacture, storage, or handling of our company products, and provide emergency showers and emergency eyewash facility near the handling site.
	Permissible concentration It is not established.

	<p>Protective equipment</p> <p>During operation, wear a gas mask for organic gas, gloves, apron, and boots (use a chloroprene rubber protective equipment because it penetrates nitrile rubber and vinyl chloride protective equipment) to avoid contact with the skin; also use goggles to prevent air from entering so that eye irritation can be avoided.</p>
	<p>Precautions</p> <p>The operation manager should educate operators about the selection of appropriate protective equipment, proper usage method, and control method of the work site.</p>
Consumer	This product is not used directly by general consumers.
Environment	Take care not to discharge the spilled product into rivers, etc., and affect the environment. Since the product has a strong odor or irritancy, take appropriate measures, such as notifying people in the vicinity of the leakage.
Special notes (emergency measures in case of leakage, etc.)	If the product leaks, allow it to be absorbed by an absorbent, such as vermiculite, sawdust, and sand, and treat it with dilute ammonia water (e.g., 50% ethylene glycol water mixed with concentrated ammonia water [1/10 amount]). Immediately remove ignition sources from the vicinity and prepare suitable extinguishing media (foam, carbon dioxide, powder).
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	none
OECD HPV	none
REACH	https://echa.europa.eu/substance-information/-/substanceinfo/100.105.368

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 4
Health hazards	Acute toxicity (oral), Category 3
	Acute toxicity (inhalation:mist) Category 2
	Skin corrosion/irritation Category 1C
	Serious eye damage/eye irritation, Category 1
	Respiratory sensitization, Category 1
	Skin sensitisation, Category 1
Environmental hazards	Hazardous to the aquatic environment, short-term (acute) , Category 2
	Hazardous to the aquatic environment, long-term (chronic) , Category 2

Labelling Information	
Hazard pictograms (GHS)	
Signal word (GHS)	Danger
Hazard statements (GHS)	Combustible liquid (H227) Toxic if swallowed. (H301) Causes severe skin burns and eye damage. (H314) May cause an allergic skin reaction. (H317) Fatal if inhaled. (H330) May cause allergy or asthma symptoms or breathing difficulties if inhaled. (H334) Toxic to aquatic life with long lasting effects. (H411)

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	5,6,7,11,13	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.