

# SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.0  
Creation Date: July 15, 2019  
Revision Date: July 15, 2019

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## SECTION 1: Identification

### 1.1 GHS Product identifier

**Product name** Acrylic acid

### 1.2 Other means of identification

**Product number** -

**Other names** monoethylene carboxylic acid; 2-Propenoic acid; Acrylic acid

### 1.3 Recommended use of the chemical and restrictions on use

**Identified uses** Industrial and scientific research use.

**Uses advised against** no data available

### 1.4 Supplier's details

**Company** Shanghai Yien Chemical Technology Co., Ltd  
**Address** Building 6, 28 Yingong Road, Fengxian District, Shanghai  
Chemical Industry Zone, Shanghai, 201400, China  
**Telephone** +86-400-133-2688

### 1.5 Emergency phone number

**Emergency phone number** +86-400-133-2688

**Service hours** Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

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## SECTION 2: Hazard identification

### 2.1 Classification of the substance or mixture

Flammable liquids, Category 3  
Acute toxicity - Category 4, Oral  
Acute toxicity - Category 4, Dermal  
Skin corrosion, Sub-category 1A  
Acute toxicity - Category 4, Inhalation  
Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1

### 2.2 GHS label elements, including precautionary statements

**Pictogram(s)**





<b>Signal word</b>	Danger
<b>Hazard statement(s)</b>	H226 Flammable liquid and vapour H302 Harmful if swallowed H312 Harmful in contact with skin H314 Causes severe skin burns and eye damage H332 Harmful if inhaled H400 Very toxic to aquatic life
<b>Precautionary statement(s)</b>	
<b>Prevention</b>	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P233 Keep container tightly closed. P240 Ground and bond container and receiving equipment. P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment. P242 Use non-sparking tools. P243 Take action to prevent static discharges. P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... P264 Wash ... thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P260 Do not breathe dust/fume/gas/mist/vapours/spray. P261 Avoid breathing dust/fume/gas/mist/vapours/spray. P271 Use only outdoors or in a well-ventilated area. P273 Avoid release to the environment.
<b>Response</b>	P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower]. P370+P378 In case of fire: Use ... to extinguish. P301+P317 IF SWALLOWED: Get medical help. P330 Rinse mouth. P302+P352 IF ON SKIN: Wash with plenty of water/... P317 Get medical help. P321 Specific treatment (see ... on this label). P362+P364 Take off contaminated clothing and wash it before reuse. P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P363 Wash contaminated clothing before reuse. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P316 Get emergency medical help immediately. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P391 Collect spillage.
<b>Storage</b>	P403+P235 Store in a well-ventilated place. Keep cool. P405 Store locked up.
<b>Disposal</b>	P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

### 2.3 Other hazards which do not result in classification

no data available

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## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
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## SECTION 4: First-aid measures

### 4.1 Description of necessary first-aid measures

#### If inhaled

Fresh air, rest. Half-upright position. Refer for medical attention.

#### Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention .

#### Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

#### Following ingestion

Rinse mouth. Do NOT induce vomiting. Refer immediately for medical attention.

### 4.2 Most important symptoms/effects, acute and delayed

May burn skin or eyes upon short contact. INHALATION: eye and nasal irritation and lacrimation. INGESTION: may cause severe damage to the gastrointestinal tract. (USCG, 1999)

Exposure Routes: inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms: Irritation eyes, skin, respiratory system; eye, skin burns; skin sensitization

Target Organs: Eyes, skin, respiratory system (NIOSH, 2016)

### 4.3 Indication of immediate medical attention and special treatment needed, if necessary

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. Organic acids and related compounds

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## SECTION 5: Fire-fighting measures

### 5.1 Suitable extinguishing media

Use dry chemical, carbon dioxide, or alcohol foam extinguishers. Vapors are heavier than air and will collect in low areas. Vapors may travel long distances to ignition sources and flashback. Vapors in confined areas may explode when exposed to fire. Storage containers and parts of containers may rocket great distances, in many directions. In advanced or massive fires, fire fighting should be done from a safe distance or from a protected location. If a leak or spill has not ignited, use water spray to disperse the vapors. Water spray may be used to flush spills away from exposures and to dilute spills to nonflammable mixtures. If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters. Notify local health and fire officials and pollution control agencies. From a secure, explosion-proof location, use water spray to cool exposed containers. If cooling streams are ineffective (venting sound increases in volume and pitch, tank discolors or shows any signs of deforming), withdraw immediately to a secure position.

### 5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Toxic vapors are generated when heated

Behavior in Fire: May polymerize and explode (USCG, 1999)

Excerpt from ERG Guide 132P [Flammable Liquids - Corrosive]: Flammable/combustible material. May be ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers,

basements, tanks). Vapor explosion hazard indoors, outdoors or in sewers. Those substances designated with a (P) may polymerize explosively when heated or involved in a fire. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water. (ERG, 2016)

### **5.3 Special protective actions for fire-fighters**

Use water spray, alcohol-resistant foam, powder, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water. Combat fire from a sheltered position.

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## **SECTION 6: Accidental release measures**

### **6.1 Personal precautions, protective equipment and emergency procedures**

Evacuate danger area! Consult an expert! Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

### **6.2 Environmental precautions**

Evacuate danger area! Consult an expert! Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

### **6.3 Methods and materials for containment and cleaning up**

SRP: Wastewater from contaminant suppression, cleaning of protective clothing/equipment, or contaminated sites should be contained and evaluated for subject chemical or decomposition product concentrations. Concentrations shall be lower than applicable environmental discharge or disposal criteria. Alternatively, pretreatment and/or discharge to a permitted wastewater treatment facility is acceptable only after review by the governing authority and assurance that "pass through" violations will not occur. Due consideration shall be given to remediation worker exposure (inhalation, dermal and ingestion) as well as fate during treatment, transfer and disposal. If it is not practicable to manage the chemical in this fashion, it must be evaluated in accordance with EPA 40 CFR Part 261, specifically Subpart B, in order to determine the appropriate local, state and federal requirements for disposal.

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## **SECTION 7: Handling and storage**

### **7.1 Precautions for safe handling**

NO open flames, NO sparks and NO smoking. Above 48°C use a closed system, ventilation and explosion-proof electrical equipment. Vapours will be uninhibited and may polymerize in exhaust or ventilation facilities with risk of breakdown. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

### **7.2 Conditions for safe storage, including any incompatibilities**

Fireproof. Separated from strong oxidants, strong bases, strong acids and food and feedstuffs. Keep in the dark. Store only if stabilized. Store in an area without drain or sewer access. Storage conditions may vary according to the type of inhibitor used. Refer to the manufacturer's instructions for proper storage conditions. See Notes. Acrylic acid should be stored in a detached, cool, well-ventilated, non-combustible place, and its containers should be protected against physical damage. Acrylic acid can be stored only in vessels lined with glass, stainless steel, aluminum, or polyethylene. In order to inhibit polymerization during transport and storage, 200 ppm MeHQ (the monomethyl ether of hydroquinone) is commonly added to acrylic acid by the manufacturer. The presence of oxygen is required for the inhibitor to be effective. A major concern during the storage of acrylic acid is the avoidance of elevated temperatures as well as freezing, since both can lead to a failure of the inhibitor system. Ideally acrylic acid should be stored within a temperature range of 15 to 25 deg C.

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## **SECTION 8: Exposure controls/personal protection**

## 8.1 Control parameters

### Occupational Exposure limit values

TLV: 2 ppm as TWA; (skin); A4 (not classifiable as a human carcinogen). MAK: 30 mg/m<sup>3</sup>, 10 ppm; peak limitation category: I(1); pregnancy risk group: C. EU-OEL: 29 mg/m<sup>3</sup>, 10 ppm as TWA; 59 mg/m<sup>3</sup>, 20 ppm as STEL

### Biological limit values

no data available

## 8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

## 8.3 Individual protection measures, such as personal protective equipment (PPE)

### Eye/face protection

Wear face shield or eye protection in combination with breathing protection.

### Skin protection

Protective gloves. Protective clothing.

### Respiratory protection

Use ventilation, local exhaust or breathing protection.

### Thermal hazards

no data available

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## SECTION 9: Physical and chemical properties and safety characteristics

<b>Physical state</b>	Liquid. Homogeneous.
<b>Colour</b>	Colourless.
<b>Odour</b>	Acrid odor and fumes
<b>Melting point/freezing point</b>	Ca. 13 °C.
<b>Boiling point or initial boiling point and boiling range</b>	Ca. 141 °C. Atm. press.: 1 013 hPa.
<b>Flammability</b>	Class II Combustible Liquid: Fl.P. at or above 100°F and below 140°F.
<b>Lower and upper explosion limit/flammability limit</b>	Lower flammable limit: 2.4% by volume; Upper flammable limit: 8.0% by volume
<b>Flash point</b>	54 °C. Atm. press.: 1 atm.
<b>Auto-ignition temperature</b>	390 °C. Atm. press.: 1 atm.
<b>Decomposition temperature</b>	no data available
<b>pH</b>	pH = 3 (approximately)
<b>Kinematic viscosity</b>	no data available
<b>Solubility</b>	Miscible with water
<b>Partition coefficient n-octanol/water</b>	log Pow = 0.38. Temperature: 25 °C.
<b>Vapour pressure</b>	3.8 hPa. Temperature: 20 °C.; 13.5 hPa. Temperature: 40 °C.; 39.9 hPa. Temperature: 60 °C.
<b>Density and/or relative density</b>	1.05 g/cm <sup>3</sup> . Temperature: 20 °C.
<b>Relative vapour density</b>	2.5 (vs air)
<b>Particle characteristics</b>	no data available

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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

The substance readily polymerizes due to heating, under the influence of light, oxygen, oxidizing agents such as peroxides or other activators (acid, iron salts). This generates fire or explosion hazard. Decomposes on heating. This produces toxic fumes. The substance is a medium strong acid. Reacts violently with strong bases and amines. Attacks many metals including nickel and copper.

Reacts violently with oxidants oxidants. This generates fire and explosion hazard.

### 10.2 Chemical stability

Acrylic acid and methacrylic acid readily polymerize in the presence of light, heat and oxygen, and also under the action of oxidizing agents such as peroxides.

### 10.3 Possibility of hazardous reactions

Flammable liquid. ... A fire hazard when exposed to heat or flame. Vapours are uninhibited and may polymerize in vents or flame arresters, causing blockage. Dust explosion possible if in powder or granular form, mixed with air. If dry, it can be charged electrostatically by swirling, pneumatic transport, pouring, etc. ACRYLIC ACID may polymerize violently especially when the frozen acid is partially thawed (freezing point 12°C or 53°F). Frozen acid should be melted at room temperature and the process should be well stirred. Do not use heat during the melting process [Kirk-Othmer, 3rd ed., Vol. 1, 1978, p. 330]. Corrodes iron and steel and polymerization may occur on contact with iron salts. The uninhibited acid polymerizes exothermically at ambient temperature and explodes if confined. The inhibitor (usually hydroquinone) greatly reduces the tendency to polymerize. Explosive polymerization can also occur with strong bases, amines, ammonia, oleum, chlorosulfonic acid, and peroxides. Mixing with 2-aminoethanol, 28% ammonium hydroxide, ethylenediamine or ethyleneimine in a closed container causes an increase in temperature and pressure. Can react violently with oxidizing reagents and strong bases [Bretherick, 5th ed., 1995, p. 419].

### 10.4 Conditions to avoid

no data available

### 10.5 Incompatible materials

Violent reaction with strong oxidizers. Incompatible with sulfuric acid, caustics, ammonia, amines, isocyanates, alkylene oxides, epichlorohydrin, toluene diamine, oleum, pyridine, methyl pyridine, n-methyl pyrrolidone, 2-methyl-6-ether aniline, aniline, ethylene diamine, ethyleneimine, and 2-aminoethanol. Severely corrodes carbon steel and iron; attacks other metals. May accumulate static electrical charges and may cause ignition of its vapors.

### 10.6 Hazardous decomposition products

Acrylic acid rapidly decomposes in the atmosphere by photochemical attack on the double bond.

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## SECTION 11: Toxicological information

### Acute toxicity

- Oral: LD50 Rat oral 193 mg/kg
- Inhalation: LC50 Rat inhalation 1200 ppm/4 hr
- Dermal: LD50 Rabbit percutaneous 290 mg/kg

### Skin corrosion/irritation

no data available

### Serious eye damage/irritation

no data available

### Respiratory or skin sensitization

no data available

### **Germ cell mutagenicity**

no data available

### **Carcinogenicity**

Evaluation: No epidemiological data relevant to the carcinogenicity of acrylic acid were available. No experimental data relevant to the carcinogenicity of acrylic acid were available. Overall evaluation: Acrylic acid is not classifiable as to its carcinogenicity in humans (Group 3).

### **Reproductive toxicity**

No information is available on the reproductive or developmental effects of acrylic acid in humans. Decreased body weight gain and decreased fertility were reported in one study of rats exposed to acrylic acid by ingestion, although the decrease in fertility was not statistically significant compared with the control. Embryotoxic and teratogenic effects (birth defects) were observed in rats injected with acrylic acid.

### **STOT-single exposure**

The substance is corrosive to the eyes and skin. Corrosive on ingestion. The vapour is severely irritating to the eyes and respiratory tract.

### **STOT-repeated exposure**

Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the upper respiratory tract and lungs. This may result in reduced lung function and hyperreactivity of the airways. See Notes.

### **Aspiration hazard**

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C, on spraying or dispersing much faster.

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## **SECTION 12: Ecological information**

### **12.1 Toxicity**

- Toxicity to fish: LC50; Species: Brachydanio rerio (Zebra fish); Conditions: semi-static, open system, measured concentration; Concentration: 222 mg/L/96 hr
- Toxicity to daphnia and other aquatic invertebrates: EC50 - 95 mg/L - 48 h.
- Toxicity to algae: EC50 - 0.04 mg/L - 72 h.
- Toxicity to microorganisms: no data available

### **12.2 Persistence and degradability**

AEROBIC: Acrylic acid, present at 100 mg/L, reached 68% of its theoretical BOD in 2 weeks using an activated sludge inoculum at 30 mg/L and the Japanese MITI test(1). The BOD5/COD ratio for acrylic acid was determined to be 0.22, which is indicative of significant potential for biodegradability(2). A microbial degradation study of acrylic acid in soil indicated that acrylic acid, formed from hydrolysis of acrylamide added to soil, was totally degraded within 15 days of its formation(3).

### **12.3 Bioaccumulative potential**

An estimated BCF of 3 was calculated in fish for acrylic acid(SRC), using a log Kow of 0.35(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

### **12.4 Mobility in soil**

Koc values for acrylic acid have been reported as 6 in Washington clay/loam (29% sand, 42% silt, 29% clay, 3.39% organic carbon, pH 6.0), 9 in Canfield loam (45% sand, 42% silt, 13% clay, 4.58% organic carbon, pH 6.1), 29 in Ellsworth loam (35% sand, 40% silt, 25% clay, 1.42% organic carbon, pH 7.2), 137 in Tyner loamy sand (79% sand, 14% silt, 7% clay, 0.46% organic carbon, pH 5.2), and 33 in sandy loam sediment (53% sand, 28% silt, 19% clay, 1.23% organic carbon, pH 7.5)(1) According to a classification scheme(2), these Koc values suggest that acrylic acid is expected to have very high to high mobility in soil. The pKa of acrylic acid is 4.26(3), indicating that this compound will exist almost

entirely in anion form in the environment and anions generally do not adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts(4).

## 12.5 Other adverse effects

no data available

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## SECTION 13: Disposal considerations

### 13.1 Disposal methods

#### Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

#### Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

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## SECTION 14: Transport information

### 14.1 UN Number

ADR/RID: UN2218 (For reference only, please check.)

IMDG: UN2218 (For reference only, please check.)

IATA: UN2218 (For reference only, please check.)

### 14.2 UN Proper Shipping Name

ADR/RID: ACRYLIC ACID, STABILIZED (For reference only, please check.)

IMDG: ACRYLIC ACID, STABILIZED (For reference only, please check.)

IATA: ACRYLIC ACID, STABILIZED (For reference only, please check.)

### 14.3 Transport hazard class(es)

ADR/RID: 8 (For reference only, please check.)

IMDG: 8 (For reference only, please check.)

IATA: 8 (For reference only, please check.)

### 14.4 Packing group, if applicable

ADR/RID: II (For reference only, please check.)

IMDG: II (For reference only, please check.)

IATA: II (For reference only, please check.)

### 14.5 Environmental hazards

ADR/RID: Yes

IMDG: Yes

IATA: Yes

### 14.6 Special precautions for user

no data available

### 14.7 Transport in bulk according to IMO instruments

no data available

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## SECTION 15: Regulatory information

### 15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
Acrylic acid	Acrylic acid	79-10-7	201-177-9
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.

United States Toxic Substances Control Act (TSCA) Inventory	Listed.
China Catalog of Hazardous chemicals 2015	Listed.
New Zealand Inventory of Chemicals (NZIoC)	Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Listed.
Vietnam National Chemical Inventory	Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)	Listed.
Korea Existing Chemicals List (KECL)	Listed.

## SECTION 16: Other information

### Information on revision

**Creation Date** July 15, 2019

**Revision Date** July 15, 2019

### Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

### References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: [http://www.echemportal.org/echemportal/index?pageID=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en)
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

### Other Information

Acrylic acid is commercially available in stabilized form by addition of polymerization inhibitors (see Chemical Dangers). Acrylic acid solidifies below 14 °C leading to a localized depletion of stabilizer. Follow the manufacturer's instructions regarding thawing. An added stabilizer or inhibitor can influence the toxicological properties of this substance; consult an expert. Immediate administration of an appropriate inhalation therapy by a doctor, or by an authorized person, should be considered. Someone who has shown signs of sensitivity to the substance should avoid any further contact with this substance or any other acrylates.

**Any questions regarding this SDS, Please send your inquiry to [sds@xixisys.com](mailto:sds@xixisys.com)**

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