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ISO 9001: 2015

MATERIAL SAFETY DATA SHEET

1. Identification

1.1 GHS Product identifier

Acrylic acid, 99%
Code A 1405

2. Hazard identification

2.1 Classification of the substance or mixture

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

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Hazard statement(s)

Danger
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

Precautionary statement(s)

Prevention

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.
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.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P370+P378 In case of fire: Use ... to extinguish.
P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
P330 Rinse mouth.

Response

P302+P352 IF ON SKIN: Wash with plenty of water/...
 P312 Call a POISON CENTER/doctor/2026 if you feel unwell.
 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.
 P310 Immediately call a POISON CENTER/doctor/2026
 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.
 P403+P235 Store in a well-ventilated place. Keep cool.
 P405 Store locked up.
 P501 Dispose of contents/container to ...

Storage

Disposal

2.3 Other hazards which do not result in classification

none

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
acrylic acid	acrylic acid	79-10-7	none	100%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

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

In case of skin contact

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

In case of eye contact

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

If swallowed

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/

5. Fire-fighting measures

5.1 Extinguishing media

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

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

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.

7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

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°C.

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

Recommended Exposure Limit: 10-hour Time-Weighted Average: 2 ppm (6 mg/cu m) [skin].

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

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

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state	Colorless liquid
Colour	Volatile liquid
Odour	Acrid odor and fumes
Melting point/ freezing point	315°C (lit.)
Boiling point or initial boiling point and boiling range	139°C (lit.)

Flammability	Class II Combustible Liquid: Fl.P. at or above 37.78°C and below 60°C. Flammable. Many reactions may cause fire or explosion. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit / flammability limit	Lower flammable limit: 2.4% by volume; Upper flammable limit: 8.0% by volume
Flash point	46°C
Auto-ignition temperature	395.56°C
Decomposition temperature	no data available
pH	pH = 3 (approximately)
Kinematic viscosity	no data available
Solubility	In water: MISCIBLE
Partition coefficient n-octanol/water (log value)	no data available
Vapour pressure	4 mm Hg (20 °C)
Density and/or relative density	1.051g/mL at 25°C (lit.)
Relative vapour density	2.5 (vs air)
Particle characteristics	no data available

10. Stability and reactivity

10.1 Reactivity

no data available

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 11.67°C). 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.

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

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

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: LC50; Species: Daphnia magna (Water flea, age < or =24 hr); Conditions: freshwater, static, 20-22°C, pH 7.6-7.7; Concentration: 270 mg/L for 24 hr /formulation

Toxicity to algae: Toxicity threshold (cell multiplication inhibition test): Algae (Microcystis aeruginosa) 0.15 mg/L.

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

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.

14. Transport information**14.1 UN Number**

ADR/RID: UN2218

IMDG: UN2218

IATA: UN2218

14.2 UN Proper Shipping Name

ADR/RID: ACRYLIC ACID, STABILIZED

IMDG: ACRYLIC ACID, STABILIZED

IATA: ACRYLIC ACID, STABILIZED

14.3 Transport hazard class(es)

ADR/RID: 3

IMDG: 3

IATA: 3

14.4 Packing group, if applicable

ADR/RID: II

IMDG: II

IATA: II

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 Annex II of MARPOL 73/78 and the IBC Code

no data available

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	none
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.

Section 16: Other Information

This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.

