1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Glacial acetic acid
Product Number : A9967
Brand : Sigma-Aldrich
Supplier : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052
Emergency Phone # (For both supplier and manufacturer) : (314) 776-6555
Preparation Information : Sigma-Aldrich Corporation
Product Safety - Americas Region
1-800-521-8956

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Combustible Liquid, Target Organ Effect, Harmful by skin absorption., Skin sensitiser, Corrosive

Target Organs
Teeth., Kidney

Other hazards which do not result in classification
Lachrymator.

GHS Classification
Flammable liquids (Category 3)
Acute toxicity, Oral (Category 5)
Acute toxicity, Inhalation (Category 3)
Acute toxicity, Dermal (Category 4)
Skin corrosion (Category 1A)
Serious eye damage (Category 1)
Skin sensitization (Category 1)
Acute aquatic toxicity (Category 3)

GHS Label elements, including precautionary statements

Signal word : Danger
Hazard statement(s)
H226 Flammable liquid and vapour.
H303 May be harmful if swallowed.
H312 Harmful in contact with skin.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H331 Toxic if inhaled.
H402 Harmful to aquatic life.
Precautionary statement(s)
P261  Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P280  Wear protective gloves/ protective clothing/ eye protection/ face protection.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310  Immediately call a POISON CENTER or doctor/ physician.

HMIS Classification
Health hazard: 3
Chronic Health Hazard: *
Flammability: 2
Physical hazards: 0

NFPA Rating
Health hazard: 3
Fire: 2
Reactivity Hazard: 0

Potential Health Effects
Inhalation May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Skin Causes skin burns.
Eyes Causes eye burns. Causes severe eye burns.
Ingestion May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms
Acetic acid
Glacial acetic acid

Formula
C₂H₄O₂

Molecular Weight
60.05 g/mol

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic acid</td>
<td>64-19-7</td>
<td>200-580-7</td>
<td>607-002-00-6</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Conditions of flammability
Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.
Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Carbon oxides

Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
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</thead>
<tbody>
<tr>
<td>Acetic acid</td>
<td>64-19-7</td>
<td>TWA</td>
<td>10 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td>Remarks</td>
<td></td>
<td></td>
<td></td>
<td>Eye &amp; Upper Respiratory Tract irritation Pulmonary function</td>
</tr>
<tr>
<td>STEL</td>
<td></td>
<td>15 ppm</td>
<td></td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td>TWA</td>
<td></td>
<td>10 ppm</td>
<td>25 mg/m3</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The value in mg/m3 is approximate.</td>
</tr>
<tr>
<td>TWA</td>
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<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td>TWA</td>
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<td>10 ppm</td>
<td>25 mg/m3</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td>ST</td>
<td></td>
<td>15 ppm</td>
<td>37 mg/m3</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
</tbody>
</table>
Personal protective equipment

**Respiratory protection**
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Hand protection**
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.

**Eye protection**
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin and body protection**
Complete suit protecting against chemicals. Flame retardant antistatic protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Hygiene measures**
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance**
- **Form**: liquid
- **Colour**: colourless

**Safety data**
- **pH**: 2.4 at 60.05 g/l
- **Melting point/freezing point**: Melting point/range: 16.2 °C (61.2 °F) - lit.
- **Boiling point**: 117 - 118 °C (243 - 244 °F) - lit.
- **Flash point**: 40.0 °C (104.0 °F) - closed cup
- **Ignition temperature**: 485 °C (905 °F)
- **Autoignition temperature**: 485.0 °C (905.0 °F)
- **Lower explosion limit**: 4 %(V)
- **Upper explosion limit**: 19.9 %(V)
- **Vapour pressure**: 73.3 hPa (55.0 mmHg) at 50.0 °C (122.0 °F)
  15.2 hPa (11.4 mmHg) at 20.0 °C (68.0 °F)
- **Density**: 1.049 g/cm³ at 25 °C (77 °F)
- **Water solubility**: completely miscible
- **Partition coefficient**: log Pow: -0.17
- **Relative vapour density**: no data available
- **Odour**: pungent
- **Odour Threshold**: no data available
- **Evaporation rate**: no data available

### 10. STABILITY AND REACTIVITY
Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
no data available

Conditions to avoid
Heat, flames and sparks.

Materials to avoid
Oxidizing agents, Soluble carbonates and phosphates, Hydroxides, Metals, Peroxides, permanganates, e.g. potassium permanganate, Amines, Alcohols

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50
LD50 Oral - rat - 3,310 mg/kg

Inhalation LC50
LC50 Inhalation - mouse - 1 h - 5620 ppm

Dermal LD50
LD50 Dermal - rabbit - 1,112 mg/kg

Other information on acute toxicity
no data available

Skin corrosion/irritation
Serious eye damage/eye irritation
Eyes - rabbit - Corrosive to eyes

Respiratory or skin sensitization
May cause sensitization by skin contact.

Germ cell mutagenicity
no data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

no data available

Teratogenicity

no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
no data available

**Specific target organ toxicity - repeated exposure (Globally Harmonized System)**
no data available

**Aspiration hazard**
no data available

**Potential health effects**

**Inhalation**
May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

**Ingestion**
May be harmful if swallowed.

**Skin**
Causes skin burns.

**Eyes**
Causes eye burns. Causes severe eye burns.

**Signs and Symptoms of Exposure**
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Ingestion or inhalation of concentrated acetic acid causes damage to tissues of the respiratory and digestive tracts. Symptoms include: hematemesis, bloody diarrhea, edema and/or perforation of the esophagus and pylorus, pancreatitis, hematuria, anuria, uremia, albuminuria, hemolysis, convulsions, bronchitis, pulmonary edema, pneumonia, cardiovascular collapse, shock, and death. Direct contact or exposure to high concentrations of vapor with skin or eyes can cause: erythema, blisters, tissue destruction with slow healing, skin blackening, hyperkeratosis, fissures, corneal erosion, opacification, iritis, conjunctivitis, and possible blindness., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

**Synergistic effects**
no data available

**Additional Information**
RTECS: AF1225000

**12. ECOLOGICAL INFORMATION**

**Toxicity**

**Toxicity to fish**
LC50 - Pimephales promelas (fathead minnow) - 79 - 88 mg/l - 96 h
LC50 - Lepomis macrochirus - 75 mg/l - 96 h

**Toxicity to daphnia and other aquatic invertebrates.**
EC50 - Daphnia magna (Water flea) - 65 mg/l - 48 h

**Persistence and degradability**

**Biodegradability**
aerobic
Result: 99 % - Readily biodegradable.
Remarks: Expected to be biodegradable

**Bioaccumulative potential**
no data available

**Mobility in soil**
no data available

**PBT and vPvB assessment**
no data available

**Other adverse effects**

**Biochemical Oxygen Demand (BOD)**
880 mg/g

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Harmful to aquatic life.

**Additional ecological information**
no data available
13. DISPOSAL CONSIDERATIONS

**Product**
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

**Contaminated packaging**
Dispose of as unused product.

14. TRANSPORT INFORMATION

**DOT (US)**
- UN number: 2789
- Class: 8 (3)
- Packing group: II
- Proper shipping name: Acetic acid, glacial
- Reportable Quantity (RQ): 5000 lbs
- Marine pollutant: No
- Poison Inhalation Hazard: No

**IMDG**
- UN number: 2789
- Class: 8 (3)
- Packing group: II
- EMS-No: F-E, S-C
- Proper shipping name: ACETIC ACID, GLACIAL
- Marine pollutant: No

**IATA**
- UN number: 2789
- Class: 8 (3)
- Packing group: II
- Proper shipping name: Acetic acid, glacial

15. REGULATORY INFORMATION

**OSHA Hazards**
Combustible Liquid, Target Organ Effect, Harmful by skin absorption., Skin sensitiser, Corrosive

**SARA 302 Components**
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components**
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 311/312 Hazards**
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**

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**Pennsylvania Right To Know Components**

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**New Jersey Right To Know Components**

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**California Prop. 65 Components**
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

**Further information**
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.