Material Safety Data Sheet

Section 1 - Product and Company Information

Product Name: Acetic acid, glacial, ≥99.8%
Product Number: 69608A
Brand: Sigma-Aldrich
Company: Sigma-Aldrich
Address: 3050 Spruce Street
City, State, Zip, Country: ST LOUIS, MO 63103 US
Technical Phone: 800-355-5332
Fax: 800-326-5202
Emergency Phone: 314-776-6555

Section 2 - Composition/Information on Ingredient

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>CAS #</th>
<th>SARA 311</th>
<th>EC no</th>
<th>Annex / Index Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACETIC ACID</td>
<td>64-19-7</td>
<td>No</td>
<td>200-580-7</td>
<td>007-0202-00-6</td>
</tr>
</tbody>
</table>

Formula: C2H4O2
Synonyme: Acetic acid (ACSH, CAS-01), Acetic acid, glacial (French), Acido acetico (Italian), Essigsäure (German), Ethanoic acid, Ethylacetic acid, Kyselina ooctava (Czech), Methylenecarboxylic acid, Octylo kwas (Polish), Vinegar acid

Section 3 - Hazards Identification

HMIS Rating: Health: 3, Flammability: 2, Reactivity: 1
NFPA Rating: Health: 3, Flammability: 2, Reactivity: 1
*For additional information on toxicity, please refer to Section 11

Section 4 - First Aid Measures

Dermal Exposure: In case of contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.
Eye Exposure: In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

Flash Point: 104 °F, 40 °C
Explosion Limits: Lower: 4 %, Upper: 19.9 %
Autoignition Temp: 427 °C
Extinguishing Media: Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.
Firefighting: Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Combustible liquid. Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill: Evacuate area.
Procedure(s) of Personal Protection(s): Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.
Methods for Cleaning Up: Cover with dry earth or soda ash, pick up, keep in a closed container, and hold for waste disposal/entrapment area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling: User Exposure: Do not breathe vapor. Do not get in eyes, on skin, or on clothing. Avoid prolonged or repeated exposure.
Storage: Suitable: Keep tightly closed. Keep away from heat and open flame.
Special Requirements: Moisture sensitive.

Section 8 - Exposure Controls / PPE

Engineering Controls: Safety shower and eye bath. Use only in a chemical fume hood.
Personal Protective Equipment: Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows a need for high respirators, respirators are appropriate. Use a full-face respirator with multipurpose combination (US) or tyke 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.

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Section 9 - Physical/Chemical Properties

**Appearance**
- Physical State: Liquid
- Color: Colorless

**Molecular Weight**
- 60.05 AMU

**Property** | **Value** | **At Temperature or Pressure** | **Other** |
--- | --- | --- | --- |
pH | 2.4 | | |
BP/BP Range | 177 - 118 °C | 760 mm Hg | |
MP/BP Range | 14 °C | | |
Freezing Point | | | |
Vapor Pressure | 1.4 mm Hg | 20 °C | |
Vapor Density | 2.27 g/L | | |
Saturated Vapor Conc. | NA | | |
SG/Density | 1.349 g/cm³ | | |
Bulk Density | NA | | |
Odor Threshold | NA | | |
Volatile’s | NA | | |
VOC Content | NA | | |
Water Content | NA | | |
Solvent Content | NA | | |
Evaporation Rate | NA | | |
Viscosity | NA | | |
Surface Tension | 26.8 mN/m | 10 °C | |
Partition Coefficient Log Kow | <0.17 | | |
Decomposition Temp. | NA | | |
Flash Point °F | 104 °F | Method: closed cup | |
Flash Point °C | 46 °C | Method: closed cup | |
Explosion Limits Lower: 4% | | | |
Flammability | | | |
Autoignition Temp | 427 °C | | |

Section 10 - Stability and Reactivity

**Stability**
- Stable

**Conditions to Avoid**
- Moisture

**Materials to Avoid**
- Oxidizing agents, Soluble carbonates and phosphates, Hydroxides, Oxides, Metals, Peroxides, Permanganates, Amines, Alcohols

**Hazardous Decomposition Products**
- Carbon monoxide, Carbon dioxide

**Hazardous Polymerization**
- Will not occur

Section 11 - Toxicological Information

**Route of Exposure**
- Skin Contact
  - Causes burns.
  - Skin Absorption: Harmful if absorbed through skin.

**Eye Contact**
- Causes burns.

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

**Target Organ(s) or System(s)**
- Teeth, Kidneys.

**Signs and Symptoms of Exposure**
- Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi; chemical pneumonitis; and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Inhalation of concentrated acetic acid causes damage to tissues of the respiratory and digestive tracts. Symptoms include: pain, malaise, bloody diarrhea, edema and/or perforation of the esophagus and pylorus, 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, blistering, tissue destruction with slow healing, skin blackening, hyperkeratosis, ulcers, 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.

**Conditions Aggravated by Exposure**
- Severe, acute pancreatitis may occur after ingestion of concentrated acetic acid.

**RTECS Number**
- AF1226000

**Toxicity Data**
- Oral - Rat: 3310 mg/kg (LD50)
- Injection - Mouse: 6,620 ppm (LC50)

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**Refractive Index**
- 1.3715

**Solubility**
- Solubility in Water: Miscible
- Other Solvents: MISCELLANEOUS WITH ALCOHOL, ETHER, GLYCEROL, ACETONE, BENZENE

N/A = not available
Section 13 - Disposal Considerations

Appropriate Method of Disposal of Substance or Preparation
This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: Acetic acid, glacial [or] Acetic acid solution, [with more than 80 percent acid, by mass]
UN#: 2789
Class: II
Packing Group: Packing Group II
Hazard Label: Corrosive
Hazard Label: Flammable liquid
PIH: Not PIH
IATA
Proper Shipping Name: Acetic acid, glacial
IATA UN Number: 2789
Hazard Class: II
Packing Group: II

Section 15 - Regulatory Information

EU Directives Classification
Symbol of Danger: C
Indication of Danger: Corrosive.
Risk Statements: R: 10 35
Flammable. Causes severe burns.
Safety Statements: S: 23 26 45
Do not breathe vapor. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice in case of accident or if you feel unwell. Seek medical advice immediately (show the label where possible).

US Classification and Label Text
Risk Statements: Causes severe burns. Hazardous in contact with skin.
Safety Statements: Keep away from sources of ignition - no smoking. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
US Statements: Lachrymator. Target organ(s): Teeth: Kidneys.

United States Regulatory Information
SARA Listed: No
TSCA Inventory Item: Yes

Canada Regulatory Information
WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR. And the MSDS contains all the information required by the CPR.
Section 16 - Other Information

Disclaimer
For R&D use only. Not for drug, household or other uses.

Warranty
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 Inc., 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. Copyright © 2008 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.