



SIGMA-ALDRICH

Material Safety Data Sheet

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Version 1.150

Section 1 - Product and Company Information

Product Name	Acetic acid, glacial, ≥99.85%	
Product Number	695084	
Brand	Sigma-Aldrich	
Company Address	Sigma-Aldrich 3050 Spruce Street	
City, State, Zip, Country	SAINT LOUIS, MO 63103 US	
Technical Phone:	800-325-5832	Emergency Phone: 314-776-6555
Fax:	800-325-5052	

Section 2 - Composition/Information on Ingredient

<u>Substance Name</u>	<u>CAS #</u>	<u>SARA 313</u>	<u>EC no</u>	<u>Annex I Index Number</u>
ACETIC ACID	64-19-7	No	200-580-7	607-002-00-6

Formula	C2H4O2
Synonyms	Acetic acid (ACGIH/OSHA), Acetic acid, glacial, Acide acetique (French), Acido acetico (Italian), Azijnzuur (Dutch), Essigsaeure (German), Ethanoic acid, Ethylic acid, Glacial acetic acid, Kyselina octova (Czech), Methanecarboxylic acid, Octowy kwas (Polish), Vinegar acid

Section 3 - Hazards Identification

Emergency Overview

Combustible (USA) Flammable (EU), Corrosive.
Causes severe burns. Harmful in contact with skin.
Lachrymator. Target organ(s): Teeth, Kidneys.

HMIS Rating
Health: 3* Flammability: 2 Reactivity: 1

NFPA Rating
Health: 3 Flammability: 2 Reactivity: 1

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

Oral Exposure

If swallowed, wash out mouth with water provided person is conscious. Call a physician. Do not induce vomiting.

Inhalation Exposure

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

Dermal Exposure

In case of skin 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 Precaution(s)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

Methods for Cleaning Up

Cover with dry lime or soda ash, pick up. Keep in a closed container, and hold for waste disposal. Ventilate 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, 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 air-purifying respirators are appropriate, use a fullface 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 fullface supplied air respirator.

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Hand

Compatible chemical-resistant gloves.

Eye

Chemical safety goggles.

Other

Faceshield (8-inch minimum).

General Hygiene Measures

Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

Exposure Limits

Country	Type	Value
Poland	NDS	15 MG/M3
Poland	NDSch	30 MG/M3
Poland	NDSP	-

Exposure Limits, RTECS

Country	Source	Type	Value
USA	ACGIH	STEL	15 PPM
USA	ACGIH	TWA	10 PPM
USA	MSHA Standard-air	TWA	10 PPM (25 MG/M3)
USA	OSHA	PEL	8H TWA 10 PPM (25 MG/M3)
New Zealand	OEL		
USA	NIOSH	TWASTEL	10 PPM 15 PPM

Remarks check ACGIH TLV**Section 9 - Physical/Chemical Properties**

Appearance	Physical State	Color
	Liquid	Colorless
Molecular Weight	60.05 AMU	
Property	Value	At Temperature or Pressure Other
pH	2.4	Concentration: 60.05 g/l
BP/BP Range	117 - 118 °C	760 mmHg
MP/MP Range	16 °C	
Freezing Point		
Vapor Pressure	11.4 mmHg	20 °C
Vapor Density	2.07 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	1.049 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	28.8 mN/m	10 °C
Partition Coefficient	Log Kow: -0.17	
Decomposition Temp.	N/A	
Flash Point °F	104 °F	Method: closed cup
Flash Point °C	40 °C	Method: closed cup
Explosion Limits	Lower: 4 % Upper: 19.9 %	59 °C
Flammability	N/A	
Autoignition Temp	427 °C	

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Sigma-Aldrich Corporation
www.sigma-aldrich.com**Refractive Index** 1.3715**Solubility****Solubility in Water:** Miscible.**Other Solvents:** MISCIBLE WITH ALCOHOL, ETHER, GLYCEROL, ACETONE, BENZENE

N/A = not available

Section 10 - Stability and Reactivity**Stability****Stable**

Stable.

Conditions to Avoid

Moisture.

Materials to Avoid

Oxidizing agents, Soluble carbonates and phosphates, Hydroxides, Oxides, Metals, Peroxides, Permanganates, Amines, Alcohols

Hazardous Decomposition Products**Hazardous Decomposition Products**

Carbon monoxide, Carbon dioxide

Hazardous Polymerization**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.

Ingestion

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. 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, 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.

Conditions Aggravated by Exposure

Severe, acute pancreatitis may occur after ingestion of concentrated acetic acid.

RTECS Number: AF1225000**Toxicity Data**

Oral - Rat: 3310 mg/kg (LD50)

Inhalation - Mouse: 5,620 ppm (LC50)

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Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Eye: Conjunctive irritation.
Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Eye: Other.
Blood: Other changes.

Intravenous - Mouse: 525 MG/KG (LD50)

Remarks: Behavioral: Convulsions or effect on seizure threshold.

Skin - Rabbit: 1060 UL/KG (LD50)

Irritation Data

Skin - Human: 50 mg 24H

Remarks: Mild irritation effect

Skin - Rabbit: 525 mg

Remarks: Open irritation test

Skin - Rabbit: 50 mg 24H

Remarks: Mild irritation effect

Eyes - Rabbit: 5 mg 30S

Remarks: Rinsed

Chronic Exposure- Mutagen

<u>Species</u>	<u>Dose</u>	<u>Cell Type</u>	<u>Mutation test</u>
Human	5 MMOL/L	lymphocyte	Sister chromatid exchange
Mouse	79279 UG/KG	Skin	Unscheduled DNA synthesis
Mouse	1201 MG/KG	Skin	Other mutation test systems
Hamster	10 MMOL/L	ovary	Cytogenetic analysis

Chronic Exposure- Reproductive Hazard

<u>Species</u>	<u>Dose</u>	<u>Route of Application</u>	<u>Exposure Time</u>
Rat	700 MG/KG	Oral	(18D POST)
	Result: Effects on Newborn: Behavioral		
Rat	400 MG/KG	Intratesticular	(1D MALE)
	Result: Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).		

Section 12 - Ecological information

Acute Ecotoxicity Tests

Test Type

EC50 Algae

Time: 24.0 h
Value: 156 mg/l

Test Type

EC50 Daphnia

Species: Daphnia magna
Time: 48.0 h
Value: 65 mg/l

Test Type

LC50 Fish

Species: Leuciscus idus
Time: 48.0 h
Value: 410 mg/l

Test Type

LC50 Fish

Species: Cyprinus carpio
Time: 48.0 h
Value: 49 mg/l

Test Type

LC50 Fish

Species

Pimephales promelas (Fathead minnow)

Time:

Value:

96.0 h

79 - 88 mg/l

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: 8

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: 8

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

Indication of Danger

Combustible (USA) Flammable (EU), Corrosive.

Risk Statements

Causes severe burns. Harmful 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. Wear suitable protective clothing, gloves, and eye/face protection.

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.

DSL: Yes
NDSL: No

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. SigmaAldrich Inc., shall not be held liable for any damage resulting from handling or fom contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright2008 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.