

ACETIC ACID

AAC

CAUTIONARY RESPONSE INFORMATION

Common Synonyms		Watery liquid	Colorless	Strong vinegar odor
Ethanoic acid Glacial acetic acid Vinegar acid		Sinks and mixes with water. Irritating vapor is produced. Freezing point is 62°F.		
<p>AVOID CONTACT WITH LIQUID AND VAPOR. Keep people away. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Stop discharge if possible. Call fire department. Isolate and remove discharged material. Notify local health and pollution control agencies. Protect water intakes.</p>				
Fire	Combustible. Vapor may explode if ignited in an enclosed area. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Extinguish with water, dry chemical, alcohol foam, or carbon dioxide. Cool exposed containers with water.			
Exposure	CALL FOR MEDICAL AID. VAPOR Irritating to nose and throat. If inhaled, will cause coughing, nausea, vomiting, or difficult breathing. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID OR SOLID Will burn skin and eyes. Harmful if swallowed. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. DO NOT INDUCE VOMITING.			
Water Pollution	HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.			

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge

2. CHEMICAL DESIGNATIONS

- 2.1 CG Compatibility Group: 4; Organic acid
- 2.2 Formula: CH₃COOH
- 2.3 IMO/UN Designation: 3.3/1842
- 2.4 DOT ID No.: 2789
- 2.5 CAS Registry No.: 64-19-7
- 2.6 NAERG Guide No.: 132
- 2.7 Standard Industrial Trade Classification: 51371

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Protective clothing should be worn when skin contact might occur. Respiratory protection necessary when exposed to vapor. Complete eye protection.
- 3.2 **Symptoms Following Exposure:** Breathing of vapors causes coughing, chest pain, and irritation of nose and throat; may cause nausea and vomiting. Contact with skin and eye causes burns.
- 3.3 **Treatment of Exposure:** INHALATION: move victim at once to fresh air; if breathing becomes difficult, give oxygen; get medical care quickly. INGESTION: if victim is conscious, have him drink water or milk; do NOT induce vomiting. Get medical care immediately. SKIN OR EYE CONTACT: flush immediately with plenty of clean running water; wash eyes for at least 15 min. and get medical care as quickly as possible; remove contaminated clothing and launder before wearing again.
- 3.4 TLV-TWA: 10 ppm
- 3.5 TLV-STEL: Not listed.
- 3.6 TLV-Ceiling: 15 ppm
- 3.7 **Toxicity by Ingestion:** Grade 2; LD₅₀ = 0.5 to 5.0 g/kg (rat)
- 3.8 **Toxicity by Inhalation:** Currently not available.
- 3.9 **Chronic Toxicity:** Currently not available
- 3.10 **Vapor (Gas) Irritant Characteristics:** Vapors cause moderate irritation such that personnel will find high concentrations unpleasant. The effect is temporary.
- 3.11 **Liquid or Solid Characteristics:** Fairly severe skin irritant; may cause pain and second-degree burns after a few minutes of contact.
- 3.12 **Odor Threshold:** 1.0 ppm
- 3.13 **IDLH Value:** 50 ppm
- 3.14 **OSHA PEL-TWA:** 10 ppm
- 3.15 **OSHA PEL-STEL:** Not listed.
- 3.16 **OSHA PEL-Ceiling:** Not listed.
- 3.17 **EPA AEGL:** Not listed

4. FIRE HAZARDS

- 4.1 **Flash Point:** 112°F O.C. 103°F C.C.
- 4.2 **Flammable Limits in Air:** 4.0%-19.9%
- 4.3 **Fire Extinguishing Agents:** Water, alcohol foam, dry chemical or carbon dioxide
- 4.4 **Fire Extinguishing Agents Not to Be Used:** None
- 4.5 **Special Hazards of Combustion Products:** Irritating vapor generated when heated.
- 4.6 **Behavior in Fire:** Not pertinent
- 4.7 **Auto Ignition Temperature:** 961°F
- 4.8 **Electrical Hazards:** I,D
- 4.9 **Burning Rate:** 1.6 mm/min.
- 4.10 **Adiabatic Flame Temperature:** Currently not available
- 4.11 **Stoichiometric Air to Fuel Ratio:** Currently not available
- 4.12 **Flame Temperature:** Currently not available
- 4.13 **Combustion Molar Ratio (Reactant to Product):** Currently not available
- 4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** No reaction
- 5.2 **Reactivity with Common Materials:** Corrosive, particularly when diluted. Attacks most common metals, including most stainless steels. Excellent solvent for many synthetic resins or rubber.
- 5.3 **Stability During Transport:** Stable
- 5.4 **Neutralizing Agents for Acids and Caustics:** Dilute with water, rinse with sodium bicarbonate solution.
- 5.5 **Polymerization:** Will not polymerize.
- 5.6 **Inhibitor of Polymerization:** Not pertinent

6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:**
75 ppm/96 hr/bluegill/TL₅₀/fresh water
100 ppm/96 hr/goldfish/TL₅₀/fresh water
100-330 ppm/48 hr/shrimp/LC₅₀/aerated water
- 6.2 **Waterfowl Toxicity:** Not pertinent
- 6.3 **Biological Oxygen Demand (BOD):** 52-62%, 5 days
- 6.4 **Food Chain Concentration Potential:** None noted
- 6.5 **GESAMP Hazard Profile:**
Bioaccumulation: 0
Damage to living resources: 1
Human Oral hazard: 1
Human Contact hazard: II
Reduction of amenities: XX

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Commercial; USP; CP
- 7.2 **Storage Temperature:** Ambient
- 7.3 **Inert Atmosphere:** No requirement
- 7.4 **Venting:** Open
- 7.5 **IMO Pollution Category:** D
- 7.6 **Ship Type:** 3
- 7.7 **Barge Hull Type:** 3

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Corrosive material
- 8.2 **49 CFR Class:** 8
- 8.3 **49 CFR Package Group:** II
- 8.4 **Marine Pollutant:** No
- 8.5 **NFPA Hazard Classification:**

Category	Classification
Health Hazard (Blue).....	3
Flammability (Red).....	2
Instability (Yellow).....	0
- 8.6 **EPA Reportable Quantity:** 5000
- 8.7 **EPA Pollution Category:** D
- 8.8 **RCRA Waste Number:** Not listed
- 8.9 **EPA FWPCA List:** Yes

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Liquid
- 9.2 **Molecular Weight:** 60.05
- 9.3 **Boiling Point at 1 atm:** 244°F = 117.9°C = 391.1°K
- 9.4 **Freezing Point:** 62.1°F = 16.7°C = 290°K
- 9.5 **Critical Temperature:** 610.9°F = 321.6°C = 594.8°K
- 9.6 **Critical Pressure:** 839 psia = 57.1 atm = 5.78 MN/m²
- 9.7 **Specific Gravity:** 1.051 at 20°C (liquid)
- 9.8 **Liquid Surface Tension:** Not pertinent
- 9.9 **Liquid Water Interfacial Tension:** Not pertinent
- 9.10 **Vapor (Gas) Specific Gravity:** 2.1
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.145
- 9.12 **Latent Heat of Vaporization:** 17.1 Btu/lb = 96.7 cal/g = 4.05 X 10⁵ J/kg
- 9.13 **Heat of Combustion:** -5645 Btu/lb = -3136 cal/g = -131.3 X 10⁵ J/kg
- 9.14 **Heat of Decomposition:** Not pertinent
- 9.15 **Heat of Solution:** Not pertinent
- 9.16 **Heat of Polymerization:** Not pertinent
- 9.17 **Heat of Fusion:** 45.91 cal/g
- 9.18 **Limiting Value:** Currently not available
- 9.19 **Reid Vapor Pressure:** 0.60 psia

NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
70	65.469	70	0.487	65	1.100		
80	65.089	80	0.492	70	1.097		N
90	64.709	90	0.497	75	1.093		O
100	64.320	100	0.502	80	1.090		T
110	63.940	110	0.507	85	1.087		
120	63.561	120	0.512	90	1.083		P
130	63.180	130	0.517	95	1.080		E
140	62.800	140	0.523	100	1.077		R
150	62.420	150	0.528	105	1.074		T
160	62.040	160	0.533	110	1.070		I
170	61.660	170	0.538	115	1.067		N
180	61.270	180	0.543	120	1.064		E
190	60.890	190	0.548	125	1.060		N
200	60.511	200	0.553	130	1.057		T
210	60.130	210	0.558	135	1.054		
		220	0.563	140	1.050		
		230	0.568	145	1.047		
		240	0.573	150	1.044		
				155	1.041		
				160	1.037		
				165	1.034		
				170	1.031		

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
	M	70	0.234	70	0.00247	0	0.236
	I	80	0.324	80	0.00336	25	0.245
	S	90	0.443	90	0.00451	50	0.255
	C	100	0.597	100	0.00597	75	0.264
	I	110	0.795	110	0.00780	100	0.273
	B	120	1.045	120	0.01008	125	0.282
	L	130	1.359	130	0.01289	150	0.290
	E	140	1.748	140	0.01631	175	0.299
		150	2.227	150	0.02043	200	0.307
		160	2.810	160	0.02537	225	0.315
		170	3.516	170	0.03123	250	0.323
		180	4.362	180	0.03814	275	0.330
		190	5.369	190	0.04623	300	0.338
		200	6.559	200	0.05562	325	0.345
		210	7.958	210	0.06647	350	0.352
		220	9.590	220	0.07893	375	0.359
		230	11.480	230	0.09315	400	0.366
		240	13.670	240	0.10930	425	0.372
		250	16.180	250	0.12750	450	0.379
		260	19.040	260	0.14800	475	0.385
		270	22.300	270	0.17090	500	0.391
		280	25.980	280	0.19650	525	0.398
		290	30.130	290	0.22480	550	0.403
		300	34.790	300	0.25620	575	0.409
						600	0.415