

# ACETIC ACID

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CAUTIONARY RESPONSE INFORMATION				4. FIRE HAZARDS	7. SHIPPING INFORMATION								
Common Synonyms Ethanolic acid Glacial acetic acid Vinegar acid	Watery liquid	Colorless	Strong vinegar odor	<p>4.1 Flash Point: 112°F O.C. 103°F C.C.</p> <p>4.2 Flammable Limits in Air: 4.0%-19.9%</p> <p>4.3 Fire Extinguishing Agents: Water, alcohol foam, dry chemical or carbon dioxide</p> <p>4.4 Fire Extinguishing Agents Not to Be Used: None</p> <p>4.5 Special Hazards of Combustion Products: Irritating vapor generated when heated.</p> <p>4.6 Behavior in Fire: Not pertinent</p> <p>4.7 Auto Ignition Temperature: 961°F</p> <p>4.8 Electrical Hazards: I,D</p> <p>4.9 Burning Rate: 1.6 mm/min.</p> <p>4.10 Adiabatic Flame Temperature: Currently not available</p> <p>4.11 Stoichiometric Air to Fuel Ratio: Currently not available</p> <p>4.12 Flame Temperature: Currently not available</p> <p>4.13 Combustion Molar Ratio (Reactant to Product): Currently not available</p> <p>4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed</p>	<p>7.1 Grades of Purity: Commercial; USP; CP</p> <p>7.2 Storage Temperature: Ambient</p> <p>7.3 Inert Atmosphere: No requirement</p> <p>7.4 Venting: Open</p> <p>7.5 IMO Pollution Category: D</p> <p>7.6 Ship Type: 3</p> <p>7.7 Barge Hull Type: 3</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.					8. HAZARD CLASSIFICATIONS								
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.					<p>8.1 49 CFR Category: Corrosive material</p> <p>8.2 49 CFR Class: 8</p> <p>8.3 49 CFR Package Group: II</p> <p>8.4 Marine Pollutant: No</p> <p>8.5 NFPA Hazard Classification:</p> <table> <thead> <tr> <th>Category</th> <th>Classification</th> </tr> </thead> <tbody> <tr> <td>Health Hazard (Blue)</td> <td>3</td> </tr> <tr> <td>Flammability (Red)</td> <td>2</td> </tr> <tr> <td>Instability (Yellow)</td> <td>0</td> </tr> </tbody> </table>	Category	Classification	Health Hazard (Blue)	3	Flammability (Red)	2	Instability (Yellow)	0
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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.					<p>8.6 EPA Reportable Quantity: 5000</p> <p>8.7 EPA Pollution Category: D</p> <p>8.8 RCRA Waste Number: Not listed</p> <p>8.9 EPA FWCNA List: Yes</p>								
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.					9. PHYSICAL & CHEMICAL PROPERTIES								

1. CORRECTIVE RESPONSE ACTIONS	2. CHEMICAL DESIGNATIONS
Dilute and disperse Stop discharge	<p>2.1 CG Compatibility Group: 4; Organic acid</p> <p>2.2 Formula: <chem>CH3COOH</chem></p> <p>2.3 IMO/UN Designation: 3.3/1842</p> <p>2.4 DOT ID No.: 2789</p> <p>2.5 CAS Registry No.: 64-19-7</p> <p>2.6 NAERG Guide No.: 132</p> <p>2.7 Standard Industrial Trade Classification: 51371</p>

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; LD <sub>50</sub> = 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	5. CHEMICAL REACTIVITY	6. WATER POLLUTION	7. SHIPPING INFORMATION								
<p>4.1 Flash Point: 112°F O.C. 103°F C.C.</p> <p>4.2 Flammable Limits in Air: 4.0%-19.9%</p> <p>4.3 Fire Extinguishing Agents: Water, alcohol foam, dry chemical or carbon dioxide</p> <p>4.4 Fire Extinguishing Agents Not to Be Used: None</p> <p>4.5 Special Hazards of Combustion Products: Irritating vapor generated when heated.</p> <p>4.6 Behavior in Fire: Not pertinent</p> <p>4.7 Auto Ignition Temperature: 961°F</p> <p>4.8 Electrical Hazards: I,D</p> <p>4.9 Burning Rate: 1.6 mm/min.</p> <p>4.10 Adiabatic Flame Temperature: Currently not available</p> <p>4.11 Stoichiometric Air to Fuel Ratio: Currently not available</p> <p>4.12 Flame Temperature: Currently not available</p> <p>4.13 Combustion Molar Ratio (Reactant to Product): Currently not available</p> <p>4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed</p>	<p>5.1 Reactivity with Water: No reaction</p> <p>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.</p> <p>5.3 Stability During Transport: Stable</p> <p>5.4 Neutralizing Agents for Acids and Caustics: Dilute with water, rinse with sodium bicarbonate solution.</p> <p>5.5 Polymerization: Will not polymerize.</p> <p>5.6 Inhibitor of Polymerization: Not pertinent</p>	<p>6.1 Aquatic Toxicity: 75 ppm/96 hr/bluegill/TL<sub>96</sub>/fresh water 100 ppm/96 hr/goldfish/TL<sub>96</sub>/fresh water 100-330 ppm/48 hr/shrimp/LC<sub>50</sub>/aerated water</p> <p>6.2 Waterfowl Toxicity: Not pertinent</p> <p>6.3 Biological Oxygen Demand (BOD): 52-62%, 5 days</p> <p>6.4 Food Chain Concentration Potential: None noted</p> <p>6.5 GESAMP Hazard Profile: Bioaccumulation: 0 Damage to living resources: 1 Human Oral hazard: 1 Human Contact hazard: II Reduction of amenities: XX</p>	<p>7.1 Grades of Purity: Commercial; USP; CP</p> <p>7.2 Storage Temperature: Ambient</p> <p>7.3 Inert Atmosphere: No requirement</p> <p>7.4 Venting: Open</p> <p>7.5 IMO Pollution Category: D</p> <p>7.6 Ship Type: 3</p> <p>7.7 Barge Hull Type: 3</p>								
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			9. PHYSICAL & CHEMICAL PROPERTIES								
			<p>9.1 Physical State at 15°C and 1 atm: Liquid</p> <p>9.2 Molecular Weight: 60.05</p> <p>9.3 Boiling Point at 1 atm: 244°F = 117.9°C = 391.1°K</p> <p>9.4 Freezing Point: 62.1°F = 16.7°C = 290°K</p> <p>9.5 Critical Temperature: 610.9°F = 321.6°C = 594.8°K</p> <p>9.6 Critical Pressure: 839 psia = 57.1 atm = 5.78 MN/m<sup>2</sup></p> <p>9.7 Specific Gravity: 1.051 at 20°C (liquid)</p> <p>9.8 Liquid Surface Tension: Not pertinent</p> <p>9.9 Liquid Water Interfacial Tension: Not pertinent</p> <p>9.10 Vapor (Gas) Specific Gravity: 2.1</p> <p>9.11 Ratio of Specific Heats of Vapor (Gas): 1.145</p> <p>9.12 Latent Heat of Vaporization: 17.1 Btu/lb = 96.7 cal/g = 4.05 X 10<sup>5</sup> J/kg</p> <p>9.13 Heat of Combustion: -5645 Btu/lb = -3136 cal/g = -131.3 X 10<sup>5</sup> J/kg</p> <p>9.14 Heat of Decomposition: Not pertinent</p> <p>9.15 Heat of Solution: Not pertinent</p> <p>9.16 Heat of Polymerization: Not pertinent</p> <p>9.17 Heat of Fusion: 45.91 cal/g</p> <p>9.18 Limiting Value: Currently not available</p> <p>9.19 Reid Vapor Pressure: 0.60 psia</p>								

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		N
80	65.089	80	0.492	70	1.097		O
90	64.709	90	0.497	75	1.093		T
100	64.320	100	0.502	80	1.090		
110	63.940	110	0.507	85	1.087		P
120	63.561	120	0.512	90	1.083		E
130	63.180	130	0.517	95	1.080		R
140	62.800	140	0.523	100	1.077		T
150	62.420	150	0.528	105	1.074		I
160	62.040	160	0.533	110	1.070		N
170	61.660	170	0.538	115	1.067		E
180	61.270	180	0.543	120	1.064		N
190	60.890	190	0.548	125	1.060		T
200	60.511	200	0.553	130	1.057		
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	0.00326		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