

# ACETIC ANHYDRIDE

ACA

## CAUTIONARY RESPONSE INFORMATION

<b>Common Synonyms</b>			
Acetyl oxide Acetic acid anhydride Ethanoic anhydride	Watery liquid	Colorless	Strong vinegar odor
Sinks and reacts slowly with water. Irritating vapor is produced.			
<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>			
<b>Fire</b>	Combustible. Vapor may explode if ignited in an enclosed area. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Combat fires from safe distance or from behind barrier. Extinguish with water, dry chemical, alcohol foam, or carbon dioxide. Cool exposed containers with water.		
<b>Exposure</b>	CALL FOR MEDICAL AID.  VAPOR Will burn eyes. Irritating to nose and throat. If inhaled, will cause nausea, vomiting, or difficult breathing. Move to fresh air. If in eyes, hold eyelids open and flush with plenty of water. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.  LIQUID 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.		
<b>Water Pollution</b>	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:** 11; Organic anhydride
- 2.2 **Formula:** CH<sub>3</sub>CO<sub>2</sub>COCH<sub>3</sub>
- 2.3 **IMO/UN Designation:** 8.0/1715
- 2.4 **DOT ID No.:** 1715
- 2.5 **CAS Registry No.:** 108-24-7
- 2.6 **NAERG Guide No.:** 137
- 2.7 **Standard Industrial Trade Classification:** 51372

### 3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Protective clothing when skin contact might occur; respiratory protection necessary for all exposures; complete eye protection.
- 3.2 **Symptoms Following Exposure:** Liquid is volatile and causes little irritation on uncovered skin. However, causes severe burns when clothing is wet with the chemical or if it enters gloves or shoes. Causes skin and eye burns and irritation of respiratory tract. Nausea and vomiting may develop after exposure.
- 3.3 **Treatment of Exposure:** INHALATION: move victim at once to fresh air; if not breathing, give artificial respiration; if breathing becomes difficult, give oxygen; get medical care quickly. INGESTION: do NOT induce vomiting. If conscious, give water or milk. SKIN OR EYE CONTACT WITH LIQUID OR VAPOR: flush immediately with plenty of clean running water; wash eyes for at least 15 min. and get medical care quickly.
- 3.4 **TLV-TWA:** 5 ppm
- 3.5 **TLV-STEL:** Not listed.
- 3.6 **TLV-Ceiling:** Not listed.
- 3.7 **Toxicity by Ingestion:** Grade 2; LD<sub>50</sub> = 0.5 to 5 g/kg (rat)
- 3.8 **Toxicity by Inhalation:** Currently not available.
- 3.9 **Chronic Toxicity:** Not pertinent
- 3.10 **Vapor (Gas) Irritant Characteristics:** Vapor is moderately irritating such that personnel will not usually tolerate moderate or high vapor concentrations.
- 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:** 0.14 ppm; 0.49 mg/m<sup>3</sup>
- 3.13 **IDLH Value:** 200 ppm
- 3.14 **OSHA PEL-TWA:** 5 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:** 129°F O.C. 120°F C.C.
- 4.2 **Flammable Limits in Air:** 2.7%-10.3%
- 4.3 **Fire Extinguishing Agents:** Water spray, dry chemical, alcohol foam, or carbon dioxide
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Do not use ordinary foam. Water and foam react, but heat liberated is not enough to create a hazard. Dry chemical forced below the surface can cause foaming and boiling.
- 4.5 **Special Hazards of Combustion Products:** Irritating vapors are generated when heated.
- 4.6 **Behavior in Fire:** Dangerous when exposed to heat or fire.
- 4.7 **Auto Ignition Temperature:** 626°F
- 4.8 **Electrical Hazards:** I,D
- 4.9 **Burning Rate:** 3.3 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:** Reacts slowly with water; considerable heat liberated when water spray is used.
- 5.2 **Reactivity with Common Materials:** Corrodes iron, steel, and other metals.
- 5.3 **Stability During Transport:** Stable
- 5.4 **Neutralizing Agents for Acids and Caustics:** Dilute with water; use sodium bicarbonate solution to rinse.
- 5.5 **Polymerization:** Not pertinent
- 5.6 **Inhibitor of Polymerization:** Not pertinent

### 6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:**  
265-279mg/L/48 hr/golden orfe/LC50  
55 mg/L/96 hr/bluegill/TL<sub>50</sub>/fresh water  
75 ppm/96 hr/shrimp/TL<sub>50</sub>/salt water  
100-300 ppm/48 hr/shrimp/LC<sub>50</sub>/salt water
- 6.2 **Waterfowl Toxicity:** Not pertinent
- 6.3 **Biological Oxygen Demand (BOD):** 53%, 1-5 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:

### 7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Pure: 99% min. Technical: 75-98.5% min.
- 7.2 **Storage Temperature:** Ambient
- 7.3 **Inert Atmosphere:** No requirement
- 7.4 **Venting:** Pressure-vacuum
- 7.5 **IMO Pollution Category:** C
- 7.6 **Ship Type:** 2
- 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).....	1
- 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:** 102.09
- 9.3 **Boiling Point at 1 atm:** 282°F = 139°C = 412°K
- 9.4 **Freezing Point:** -101°F = -74.1°C = 199.1°K
- 9.5 **Critical Temperature:** 564.8°F = 296°C = 569.2°K
- 9.6 **Critical Pressure:** 679 psia = 46.2 atm = 4.68 MN/m<sup>2</sup>
- 9.7 **Specific Gravity:** 1.08
- 9.8 **Liquid Surface Tension:** Not pertinent
- 9.9 **Liquid Water Interfacial Tension:** Not pertinent
- 9.10 **Vapor (Gas) Specific Gravity:** 3.52
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.093
- 9.12 **Latent Heat of Vaporization:** 119 Btu/lb = 66.2 cal/g = 2.77 X 10<sup>5</sup> J/kg
- 9.13 **Heat of Combustion:** -7058 Btu/lb = -3921 cal/g = -164.2 X 10<sup>5</sup> 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:** Currently not available
- 9.18 **Limiting Value:** Currently not available
- 9.19 **Reid Vapor Pressure:** 0.3 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
-30	71.620	0	0.419	30	1.180		N
-20	71.200	10	0.421	35	1.176		O
-10	70.790	20	0.424	40	1.171		T
0	70.370	30	0.426	45	1.166		
10	69.959	40	0.429	50	1.161		P
20	69.540	50	0.432	55	1.157		E
30	69.120	60	0.434	60	1.152		R
40	68.709	70	0.437	65	1.147		T
50	68.290	80	0.439	70	1.143		I
60	67.870	90	0.442	75	1.138		N
70	67.459	100	0.445	80	1.133		E
80	67.040	110	0.447	85	1.128		N
90	66.629	120	0.450	90	1.124		T
100	66.209	130	0.453	95	1.119		
110	65.790	140	0.455	100	1.114		
120	65.379	150	0.458	105	1.109		
130	64.959	160	0.460	110	1.105		
140	64.549	170	0.463	115	1.100		
150	64.129	180	0.466				
160	63.710	190	0.468				
170	63.300	200	0.471				
180	62.880	210	0.473				
190	62.460						
200	62.050						
210	61.630						

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
	R	70	0.082	70	0.00148	0	0.199
	E	80	0.119	80	0.00209	25	0.210
	A	90	0.168	90	0.00291	50	0.221
	C	100	0.235	100	0.00399	75	0.232
	T	110	0.323	110	0.00539	100	0.242
	S	120	0.437	120	0.00717	125	0.252
	L	130	0.584	130	0.00942	150	0.262
	S	140	0.770	140	0.01222	175	0.272
	L	150	1.004	150	0.01567	200	0.281
	O	160	1.295	160	0.01988	225	0.290
	W	170	1.654	170	0.02498	250	0.299
	L	180	2.090	180	0.03108	275	0.308
	Y	190	2.618	190	0.03833	300	0.316
		200	3.252	200	0.04688	325	0.325
		210	4.006	210	0.05688	350	0.333
		220	4.896	220	0.06851	375	0.340
		230	5.942	230	0.08194	400	0.348
		240	7.161	240	0.09734	425	0.356
		250	8.575	250	0.11490	450	0.363
		260	10.200	260	0.13480	475	0.370
		270	12.070	270	0.15730	500	0.377
		280	14.200	280	0.18260	525	0.384
		290	16.620	290	0.21080	550	0.390
		300	19.350	300	0.24220	575	0.396
		310	22.420	310	0.27700	600	0.403
		320	25.860	320	0.31550		