

# ACROLEIN

ARL

## CAUTIONARY RESPONSE INFORMATION

<b>Common Synonyms</b>		Watery liquid	Colorless to light yellow	Sharp, irritating odor
Acraldehyde Acrylaldehyde Acrylic aldehyde Allyl aldehyde Ethylene aldehyde 2-Propenal		Floats and mixes with water. Poisonous, flammable vapor is produced.		
<p><b>AVOID CONTACT WITH LIQUID AND VAPOR. KEEP PEOPLE AWAY.</b>  <b>Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).</b>  <b>Shut off ignition sources. Call fire department.</b>  <b>Stop discharge if possible. Avoid inhalation.</b>  <b>Evacuate area in case of large discharge.</b>  <b>Isolate and remove discharged material.</b>  <b>Notify local health and pollution control agencies.</b>  <b>Protect water intakes.</b></p>				
<b>Fire</b>	<p><b>FLAMMABLE.</b>  <b>POISONOUS GASES ARE PRODUCED WHEN HEATED.</b>            Containers may explode in fire.            Flashback along vapor trail may occur.            Vapor may explode if ignited in an enclosed area.            Combat fires from safe distance or protected location.            Extinguish with dry chemicals, alcohol foam, or carbon dioxide.            Water may be ineffective on fire.            Cool exposed containers with water.</p>			
<b>Exposure</b>	<p>CALL FOR MEDICAL AID.</p> <p><b>VAPOR</b>  <b>POISONOUS IF INHALED.</b>            Irritating to eyes, nose and throat.            Move victim 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.</p> <p><b>LIQUID</b>  <b>POISONOUS IF SWALLOWED.</b>            Will burn eyes.            Irritating to skin.            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 and have victim induce vomiting.            IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.</p>			
<b>Water Pollution</b>	<p>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.</p>			

<b>1. CORRECTIVE RESPONSE ACTIONS</b>	<b>2. CHEMICAL DESIGNATIONS</b>
Dilute and disperse Stop discharge	<p>2.1 <b>CG Compatibility Group:</b> Currently not available; Aldehyde</p> <p>2.2 <b>Formula:</b> CH<sub>2</sub>=CHCHO</p> <p>2.3 <b>IMO/UN Designation:</b> 6.1/1092</p> <p>2.4 <b>DOT ID No.:</b> 1092</p> <p>2.5 <b>CAS Registry No.:</b> 107-02-8</p> <p>2.6 <b>NAERG Guide No.:</b> 131P</p> <p>2.7 <b>Standard Industrial Trade Classification:</b> 51621</p>
<b>3. HEALTH HAZARDS</b>	
<p>3.1 <b>Personal Protective Equipment:</b> Chemical safety goggles and face shield; self-contained breathing apparatus, positive-pressure hose mask, airline mask or industrial canister-type gas mask; rubber safety shoes; clothing made of rubber or other impervious material.</p> <p>3.2 <b>Symptoms Following Exposure:</b> Inhalation causes irritation of nose and throat, a feeling of pressure in the chest, and shortness of breath. Nausea and vomiting commonly occur. Loss of consciousness if exposure has been sufficiently great. Congestion in the chest may be present in varying amounts, and fluid may collect in the lungs (pulmonary edema) of severely exposed persons. Vapor also causes severe eye irritation (redness, weeping, and swelling of lids); liquid burns eyes, contact with skin causes reddening or blistering. Ingestion causes severe irritation of mouth and stomach.</p> <p>3.3 <b>Treatment of Exposure:</b> Keep patient warm; if he is conscious, give coffee; call physician after all exposures to this compound. <b>INHALATION:</b> remove patient to fresh air; if breathing becomes difficult, give oxygen. If breathing has stopped, start artificial respiration. <b>EYES:</b> immediately flush with plenty of water for at least 15 min. If medical attention is not immediately available, continue eye irrigation for another 15-min. period. Upon completion of the first 15 min. of irrigation, it is permissible to instill 2 or 3 drops of an effective aqueous local eye anesthetic for relief of pain. No oils or ointments should be used unless ordered by the physician. <b>SKIN:</b> flush at once with large volumes of water. Wash thoroughly with soap and large quantities of running water. <b>INGESTION:</b> have victim drink large amounts of water. Induce vomiting by sticking a finger down the throat or by giving salt water (one tablespoon of table salt to a glass of water). Keep patient warm and quiet.</p> <p>3.4 <b>TLV-TWA:</b> 0.1 ppm</p> <p>3.5 <b>TLV-STEL:</b> Not listed.</p> <p>3.6 <b>TLV-Ceiling:</b> 0.3 ppm (Notice of Intended Change to 0.1 ppm).</p> <p>3.7 <b>Toxicity by Ingestion:</b> Grade 4; LD<sub>50</sub> below 50 mg/kg</p> <p>3.8 <b>Toxicity by Inhalation:</b> Currently not available.</p> <p>3.9 <b>Chronic Toxicity:</b> Grade 4; oral rat LD<sub>50</sub> = 46 mg/kg. Grade 4; oral rabbit LD<sub>50</sub> = 7 mg/kg</p> <p>3.10 <b>Vapor (Gas) Irritant Characteristics:</b> Vapors cause severe irritation of eyes and throat and can cause eye and lung injury. They cannot be tolerated even at low concentrations.</p> <p>3.11 <b>Liquid or Solid Characteristics:</b> Causes smarting of the skin and first-degree burns on short exposure; may cause second-degree burns on long exposure.</p> <p>3.12 <b>Odor Threshold:</b> 0.21 ppm</p> <p>3.13 <b>IDLH Value:</b> 2 ppm</p> <p>3.14 <b>OSHA PEL-TWA:</b> 0.1 ppm</p> <p>3.15 <b>OSHA PEL-STEL:</b> Not listed.</p> <p>3.16 <b>OSHA PEL-Ceiling:</b> Not listed.</p> <p>3.17 <b>EPA AEG1:</b> Not listed</p>	

## 4. FIRE HAZARDS

- 4.1 **Flash Point:** <0°F O.C.; -13°F C.C.
- 4.2 **Flammable Limits in Air:** 2.8%-31%
- 4.3 **Fire Extinguishing Agents:** Alcohol foam, dry chemical, carbon dioxide
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Water may be ineffective.
- 4.5 **Special Hazards of Combustion Products:** Poisonous vapor of acrolein is formed from hot liquid.
- 4.6 **Behavior in Fire:** Vapor is heavier than air and may travel a considerable distance to a source of ignition and flash back. Polymerization may take place, and containers may explode in fire.
- 4.7 **Auto Ignition Temperature:** 453°F
- 4.8 **Electrical Hazards:** I, B(C)
- 4.9 **Burning Rate:** 3.8 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:** No reaction
- 5.3 **Stability During Transport:** Stable when inhibited
- 5.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
- 5.5 **Polymerization:** Undergoes uncatalyzed polymerization reaction around 200°C. Light promotes polymerization.
- 5.6 **Inhibitor of Polymerization:** Hydroquinone: 0.10 to 0.25%

## 6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:** 0.08 ppm/24 hr/salmon/TL<sub>50</sub>/fresh water  
0.055 ppm/96 hr/oyster/EC<sub>50</sub>/salt water
- 6.2 **Waterfowl Toxicity:** Currently not available
- 6.3 **Biological Oxygen Demand (BOD):** 33%, 10 days
- 6.4 **Food Chain Concentration Potential:** None
- 6.5 **GESAMP Hazard Profile:** Bioaccumulation: T  
Damage to living resources: 4  
Human Oral hazard: 3  
Human Contact hazard: II  
Reduction of amenities: XXX

## 7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Industrial, 92+%
- 7.2 **Storage Temperature:** Ambient
- 7.3 **Inert Atmosphere:** No requirement
- 7.4 **Venting:** Pressure-vacuum
- 7.5 **IMO Pollution Category:** Currently not available
- 7.6 **Ship Type:** Currently not available
- 7.7 **Barge Hull Type:** Currently not available

## 8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Poison
- 8.2 **49 CFR Class:** 6.1
- 8.3 **49 CFR Package Group:** I
- 8.4 **Marine Pollutant:** Yes
- 8.5 **NFPA Hazard Classification:**
- | Category                  | Classification |
|---------------------------|----------------|
| Health Hazard (Blue)..... | 4              |
| Flammability (Red).....   | 3              |
| Instability (Yellow)..... | 3              |
- 8.6 **EPA Reportable Quantity:** 1
- 8.7 **EPA Pollution Category:** X
- 8.8 **RCRA Waste Number:** P003
- 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:** 56.1
- 9.3 **Boiling Point at 1 atm:** 127°F = 53°C = 326°K
- 9.4 **Freezing Point:** -125°F = -87°C = 186°K
- 9.5 **Critical Temperature:** (est.) 489°F = 254°C = 527°K
- 9.6 **Critical Pressure:** (est.) 737 psia = 50.0 atm = 5.08 MN/m<sup>2</sup>
- 9.7 **Specific Gravity:** 0.843 at 20°C (liquid)
- 9.8 **Liquid Surface Tension:** 24 dynes/cm = 0.024 N/m at 20°C
- 9.9 **Liquid Water Interfacial Tension:** (est.) 35 dynes/cm = 0.035 N/m at 20°C
- 9.10 **Vapor (Gas) Specific Gravity:** 1.94
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.1487
- 9.12 **Latent Heat of Vaporization:** 216 Btu/lb = 120 cal/g = 5.02 X 10<sup>5</sup> J/kg
- 9.13 **Heat of Combustion:** -12,500 Btu/lb = -6,950 cal/g = -290 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:** (est.) -50 Btu/lb = -28 cal/g = -1.2 X 10<sup>5</sup> J/kg
- 9.17 **Heat of Fusion:** Currently not available
- 9.18 **Limiting Value:** Currently not available
- 9.19 **Reid Vapor Pressure:** 8.6 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
20	53.710	0	0.522	0	1.654	0	0.525
30	53.480	10	0.524	10	1.626	5	0.508
40	53.250	20	0.527	20	1.598	10	0.492
50	53.020	30	0.529	30	1.570	15	0.477
60	52.790	40	0.532	40	1.542	20	0.463
70	52.560	50	0.534	50	1.514	25	0.449
80	52.330	60	0.537	60	1.486	30	0.436
90	52.110	70	0.539	70	1.458	35	0.424
100	51.881	80	0.542	80	1.430	40	0.412
110	51.650	90	0.544	90	1.402	45	0.401
120	51.420	100	0.547	100	1.374	50	0.390
		110	0.549	110	1.346	55	0.380
		120	0.552	120	1.318	60	0.370
						65	0.361
						70	0.352
						75	0.344
						80	0.336
						85	0.328
						90	0.320
						95	0.313
						100	0.306
						105	0.299
						110	0.293
						115	0.287
						120	0.281
						125	0.275

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
34	20.060	40	3.398	40	0.03554	100	0.285
36	20.110	50	4.358	50	0.04469	120	0.293
38	20.170	60	5.537	60	0.05568	140	0.300
40	20.220	70	6.971	70	0.06878	160	0.307
42	20.280	80	8.701	80	0.08426	180	0.315
44	20.330	90	10.770	90	0.10240	200	0.322
46	20.390	100	13.240	100	0.12360	220	0.329
48	20.440	110	16.150	110	0.14820	240	0.337
50	20.500	120	19.570	120	0.17640	260	0.344
52	20.560	130	23.560	130	0.20880	280	0.351
54	20.610	140	28.190	140	0.24560	300	0.359
56	20.670	150	33.520	150	0.28740	320	0.366
58	20.720	160	39.650	160	0.33440	340	0.373
60	20.780	170	46.640	170	0.38710	360	0.380
62	20.830	180	54.590	180	0.44600	380	0.388
64	20.890	190	63.590	190	0.51150	400	0.395
66	20.940	200	73.730	200	0.58410	420	0.402
68	21.000	210	85.099	210	0.66420	440	0.410
70	21.060						
72	21.110						
74	21.170						
76	21.220						
78	21.280						
80	21.330						
82	21.390						
84	21.440						