

ACROLEIN

ARL

CAUTIONARY RESPONSE INFORMATION

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| Common Synonyms | Watery liquid Acraldehyde Acrylaldehyde Acrylic aldehyde Allyl aldehyde Ethylene aldehyde 2-Propenal | Colorless to light yellow Sharp, irritating odor Floats and mixes with water. Poisonous, flammable vapor is produced. |
| AVOID CONTACT WITH LIQUID AND VAPOR. KEEP PEOPLE AWAY. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Shut off ignition sources. Call fire department. Stop discharge if possible. Avoid inhalation. Evacuate area in case of large discharge. Isolate and remove discharged material. Notify local health and pollution control agencies. Protect water intakes. | | |
| Fire | FLAMMABLE. POISONOUS GASES ARE PRODUCED WHEN HEATED. 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. | |
| Exposure | CALL FOR MEDICAL AID. VAPOR POISONOUS IF INHALED. 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. LIQUID POISONOUS IF SWALLOWED. 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. | |
| 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. | |

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| 1. CORRECTIVE RESPONSE ACTIONS | 2. CHEMICAL DESIGNATIONS |
| Dilute and disperse Stop discharge | 2.1 CG Compatibility Profile: Currently not available; Aldehyde 2.2 Formula: $\text{CH}_2=\text{CHCHO}$ 2.3 IMO/UN Designation: 6.1/1092 2.4 DOT ID No.: 1092 2.5 CAS Registry No.: 107-02-8 2.6 NAERG Guide No.: 131P 2.7 Standard Industrial Trade Classification: 51621 |
| 3. HEALTH HAZARDS | |
| 3.1 Personal Protective Equipment: 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. | |
| 3.2 Symptoms Following Exposure: 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. | |
| 3.3 Treatment of Exposure: Keep patient warm; if he is conscious, give coffee; call physician after all exposures to this compound. INHALATION: remove patient to fresh air; if breathing becomes difficult, give oxygen. If breathing has stopped, start artificial respiration. EYES: 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. SKIN: flush at once with large volumes of water. Wash thoroughly with soap and large quantities of running water. INGESTION: 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. | |
| 3.4 TLV-TWA: 0.1 ppm 3.5 TLV-STEL: Not listed. 3.6 TLV-Ceiling: 0.3 ppm (Notice of Intended Change to 0.1 ppm). 3.7 Toxicity by Ingestion: Grade 4; LD ₅₀ below 50 mg/kg 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: Grade 4; oral rat LD ₅₀ = 46 mg/kg. Grade 4; oral rabbit LD ₅₀ = 7 mg/kg 3.10 Vapor (Gas) Irritant Characteristics: Vapors cause severe irritation of eyes and throat and can cause eye and lung injury. They cannot be tolerated even at low concentrations. 3.11 Liquid or Solid Characteristics: Causes smarting of the skin and first-degree burns on short exposure; may cause second-degree burns on long exposure. 3.12 Odor Threshold: 0.21 ppm 3.13 IDLH Value: 2 ppm 3.14 OSHA PEL-TWA: 0.1 ppm 3.15 OSHA PEL-STEL: Not listed. 3.16 OSHA PEL-Ceiling: Not listed. 3.17 EPA AEGL: Not listed | |

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| 4. FIRE HAZARDS | 7. SHIPPING INFORMATION | | | | | | | | |
| 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. | 7.1 Grades of Purity: Industrial, 92+% | | | | | | | | |
| 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. | 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 | | | | | | | | |
| 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 | 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: <table border="1"> <tr> <td>Category</td> <td>Classification</td> </tr> <tr> <td>Health Hazard (Blue).....</td> <td>4</td> </tr> <tr> <td>Flammability (Red).....</td> <td>3</td> </tr> <tr> <td>Instability (Yellow).....</td> <td>3</td> </tr> </table> 8.6 EPA Reportable Quantity: 1 8.7 EPA Pollution Category: X 8.8 RCRA Waste Number: P003 8.9 EPA FWCRA List: Yes | Category | Classification | Health Hazard (Blue)..... | 4 | Flammability (Red)..... | 3 | Instability (Yellow)..... | 3 |
| Category | Classification | | | | | | | | |
| Health Hazard (Blue)..... | 4 | | | | | | | | |
| Flammability (Red)..... | 3 | | | | | | | | |
| Instability (Yellow)..... | 3 | | | | | | | | |
| 5. CHEMICAL REACTIVITY | 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 ² 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 ⁵ J/kg 9.13 Heat of Combustion: -12,500 Btu/lb = -6,950 cal/g = -290 X 10 ⁵ 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 ⁵ 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 | 0.04460 | 120 | 0.293 |
| 38 | 20.170 | 60 | 5.557 | 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 | | | | | | |