

ACETALDEHYDE

AAD

CAUTIONARY RESPONSE INFORMATION

| | | | | |
|---|--|--|-----------|--------------------|
| Common Synonyms | | Watery liquid | Colorless | Sharp, fruity odor |
| Acetic aldehyde Ethanal Ethyl aldehyde | | Floats and mixes with water. Flammable, irritating vapor is produced. Boiling point is 69°F. | | |
| <p>Avoid contact with liquid and vapor. Keep people away. Wear goggles and self-contained breathing apparatus. Shut off ignition sources and call fire department. Stay upwind and use water spray to "knock down" vapor. Stop discharge if possible. Isolate and remove discharged material. Notify local health and pollution control agencies.</p> | | | | |
| Fire | <p>FLAMMABLE. Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Wear goggles and self-contained breathing apparatus. Combat fires from safe distance or protected location. Extinguish with dry chemical, alcohol foam, or carbon dioxide. Water may be ineffective on fire. Cool exposed containers with water.</p> | | | |
| Exposure | <p>CALL FOR MEDICAL AID.</p> <p>VAPOR Irritating to eyes, nose and throat. If inhaled, will cause nausea, vomiting, headache, difficult breathing, or loss of consciousness. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.</p> <p>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.</p> | | | |
| Water Pollution | <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> | | | |

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge

2. CHEMICAL DESIGNATIONS

- 2.1 CG Compatibility Group: 19; Aldehyde
- 2.2 Formula: CH₃CHO
- 2.3 IMO/UN Designation: 3.1/1089
- 2.4 DOT ID No.: 1089
- 2.5 CAS Registry No.: 75-07-0
- 2.6 NAERG Guide No.: 129
- 2.7 Standard Industrial Trade Classification: 51372

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Rubber gloves, eye goggles, and other equipment to prevent any contact with body. Organic canister or air pack as required.
- 3.2 **Symptoms Following Exposure:** Breathing vapors will be irritating and may cause nausea, vomiting, headache, and unconsciousness. Contact with eyes may cause burns and eye damage. Skin contact from clothing wet with the chemical causes burns or severe irritation.
- 3.3 **Treatment of Exposure:** INHALATION: remove victim to fresh air; if breathing has stopped, give artificial respiration; if breathing is difficult, give oxygen; call a physician at once. SKIN: wash with soap and water. EYES: flush with water.
- 3.4 **TLV-TWA:** Not listed.
- 3.5 **TLV-STEL:** Not listed.
- 3.6 **TLV-Ceiling:** 25 ppm
- 3.7 **Toxicity by Ingestion:** Grade 2; LD₅₀ = 0.5 to 5g/kg (rat)
- 3.8 **Toxicity by Inhalation:** Currently not available.
- 3.9 **Chronic Toxicity:** Currently not available
- 3.10 **Vapor (Gas) Irritant Characteristics:** Vapor is moderately irritating such that personnel will not usually tolerate moderate or high concentrations.
- 3.11 **Liquid or Solid Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.
- 3.12 **Odor Threshold:** 0.05
- 3.13 **IDLH Value:** 2,000 ppm
- 3.14 **OSHA PEL-TWA:** 200 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:**
-36°F C.C.; -58°F O.C.
- 4.2 **Flammable Limits in Air:** 4%-60%
- 4.3 **Fire Extinguishing Agents:** Dry chemical, alcohol foam, carbon dioxide, or water fog.
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Water and foam may be ineffective.
- 4.5 **Special Hazards of Combustion Products:** Produces irritating vapor when heated.
- 4.6 **Behavior in Fire:** Vapors are heavier than air and may travel a considerable distance to a source of ignition and flash back.
- 4.7 **Auto Ignition Temperature:** 365°F, 300°F, 347 °F
- 4.8 **Electrical Hazards:** Class I, Group C
- 4.9 **Burning Rate:** 3.3 mm/min.
- 4.10 **Adiabatic Flame Temperature:** Currently not available
- 4.11 **Stoichiometric Air to Fuel Ratio:** 7.800 (Est.)
- 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
- 5.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
- 5.5 **Polymerization:** May occur. Avoid heat, dust, strong oxidizing or reducing substances, strong acids and bases
- 5.6 **Inhibitor of Polymerization:** None

6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:**
124-140 ppm/48 hr/golden orfe/LC50
53 ppm/96 hr/bluegill sunfish/LC50/
53 ppm/96 hr/sunfish/TL_m/fresh water
70 ppm/24 hr/pin perch/TL_m/salt water
- 6.2 **Waterfowl Toxicity:** Currently not available
- 6.3 **Biological Oxygen Demand (BOD):** 93-127%, 5 days
- 6.4 **Food Chain Concentration Potential:** None
- 6.5 **GESAMP Hazard Profile:**
Bioaccumulation: T
Damage to living resources: 2
Human Oral hazard: I
Human Contact hazard: II
Reduction of amenities: XX

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** >99%
- 7.2 **Storage Temperature:** Ambient
- 7.3 **Inert Atmosphere:** Inerted
- 7.4 **Venting:** Safety relief
- 7.5 **IMO Pollution Category:** C
- 7.6 **Ship Type:** 2
- 7.7 **Barge Hull Type:** 2

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Flammable liquid
- 8.2 **49 CFR Class:** 3
- 8.3 **49 CFR Package Group:** I
- 8.4 **Marine Pollutant:** No
- 8.5 **NFPA Hazard Classification:**

| Category | Classification |
|----------------------|----------------|
| Health Hazard (Blue) | 3 |
| Flammability (Red) | 4 |
| Instability (Yellow) | 2 |
- 8.6 **EPA Reportable Quantity:** 1000
- 8.7 **EPA Pollution Category:** C
- 8.8 **RCRA Waste Number:** U001
- 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:** 44.05
- 9.3 **Boiling Point at 1 atm:** 68.7°F = 20.4°C = 293.6°K
- 9.4 **Freezing Point:** -189°F = -123°C = 150°K
- 9.5 **Critical Temperature:** 370.4°F = 188°C = 461.2°K
- 9.6 **Critical Pressure:** 820 psia = 56 atm = 5.7 MN/m²
- 9.7 **Specific Gravity:** 0.780 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:** 1.5
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.182
- 9.12 **Latent Heat of Vaporization:** 245 Btu/lb = 136 cal/g = 5.69 X 10⁵ J/kg
- 9.13 **Heat of Combustion:** -10,600 Btu/lb = -5890 cal/g = -246.4 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:** Currently not available
- 9.18 **Limiting Value:** Currently not available
- 9.19 **Reid Vapor Pressure:** 25.6 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 | 52.490 | -100 | 0.297 | 28 | 1.317 | | N |
| -10 | 52.060 | -80 | 0.300 | 30 | 1.314 | | O |
| 0 | 51.630 | -60 | 0.304 | 32 | 1.311 | | T |
| 10 | 51.200 | -40 | 0.308 | 34 | 1.307 | | |
| 20 | 50.770 | -20 | 0.311 | 36 | 1.304 | | P |
| 30 | 50.340 | 0 | 0.315 | 38 | 1.301 | | E |
| 40 | 49.910 | 20 | 0.319 | 40 | 1.297 | | R |
| 50 | 49.480 | 40 | 0.322 | 42 | 1.294 | | T |
| 60 | 49.050 | 60 | 0.326 | 44 | 1.291 | | I |
| | | | | 46 | 1.287 | | N |
| | | | | 48 | 1.284 | | E |
| | | | | 50 | 1.281 | | N |
| | | | | 52 | 1.277 | | T |
| | | | | 54 | 1.274 | | I |
| | | | | 56 | 1.271 | | N |
| | | | | 58 | 1.267 | | E |
| | | | | 60 | 1.264 | | N |
| | | | | 62 | 1.261 | | T |
| | | | | 64 | 1.258 | | I |
| | | | | 66 | 1.254 | | N |
| | | | | 68 | 1.251 | | T |

| 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 | | 0 | 2.704 | 0 | 0.02414 | 0 | 0.269 |
| I | | 5 | 3.111 | 5 | 0.02747 | 20 | 0.276 |
| S | | 10 | 3.567 | 10 | 0.03117 | 40 | 0.283 |
| C | | 15 | 4.080 | 15 | 0.03527 | 60 | 0.290 |
| I | | 20 | 4.652 | 20 | 0.03980 | 80 | 0.298 |
| B | | 25 | 5.291 | 25 | 0.04480 | 100 | 0.305 |
| L | | 30 | 6.002 | 30 | 0.05029 | 120 | 0.312 |
| E | | 35 | 6.790 | 35 | 0.05633 | 140 | 0.319 |
| | | 40 | 7.664 | 40 | 0.06294 | 160 | 0.326 |
| | | 45 | 8.629 | 45 | 0.07016 | 180 | 0.333 |
| | | 50 | 9.693 | 50 | 0.07804 | 200 | 0.339 |
| | | 55 | 10.860 | 55 | 0.08661 | 220 | 0.346 |
| | | 60 | 12.150 | 60 | 0.09593 | 240 | 0.353 |
| | | 65 | 13.560 | 65 | 0.10600 | 260 | 0.360 |
| | | 70 | 15.100 | 70 | 0.11700 | 280 | 0.366 |
| | | 75 | 16.780 | 75 | 0.12880 | 300 | 0.373 |
| | | 80 | 18.610 | 80 | 0.14150 | 320 | 0.379 |
| | | 85 | 20.610 | 85 | 0.15520 | 340 | 0.386 |
| | | 90 | 22.770 | 90 | 0.17000 | 360 | 0.392 |
| | | 95 | 25.120 | 95 | 0.18580 | 380 | 0.398 |
| | | 100 | 27.660 | 100 | 0.20280 | 400 | 0.405 |
| | | 105 | 30.400 | 105 | 0.22090 | 420 | 0.411 |
| | | 110 | 33.360 | 110 | 0.24030 | 440 | 0.417 |
| | | 115 | 36.560 | 115 | 0.26100 | | |
| | | 120 | 39.990 | 120 | 0.28310 | | |
| | | 125 | 43.680 | 125 | 0.30660 | | |