

CROTONALDEHYDE

CTA

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Crotonaldehyde Crotonic aldehyde beta-Methylacrolein trans-2-Butenal	Watery liquid Yellow Tar odor
Floats and mixes slowly with water. Flammable, irritating vapor is produced.	
<p>Keep people away. Avoid contact with liquid and vapor. Avoid inhalation. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Shut off ignition sources and call fire department. Stay upwind and use water spray to "knock down" vapor. Notify local health and pollution control agencies. Protect water intakes.</p>	
Fire	<p>FLAMMABLE: Flashback along vapor trail may occur. 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 protected location. Extinguish with dry chemical, 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 coughing, nausea, vomiting, 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. DO NOT INDUCE VOMITING.</p>
Water Pollution	<p>Effect of low concentrations on aquatic life is unknown. Fouling to shoreline. May be dangerous if it enters water intakes. Notify local health and pollution control officials. Notify operators of nearby water intakes.</p>

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge
Clean shore line

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: 19; Aldehyde
2.2 Formula: CH₂CH=CHO
2.3 IMO/UN Designation: 3.2/1143
2.4 DOT ID No.: 1143
2.5 CAS Registry No.: 4170-30-3
2.6 NAERG Guide No.: 131P
2.7 Standard Industrial Trade Classification: 51621

3. HEALTH HAZARDS

3.1 **Personal Protective Equipment:** Air-supplied mask for concentrations above 2% by volume; plastic gloves; monogoggles; eye bath and safety shower

3.2 **Symptoms Following Exposure:** INHALATION: vapor is exceedingly irritating, causing coughing, chest pain, nausea, vomiting, and collapse. CONTACT WITH SKIN OR EYES: may cause burns and systemic illness. Contact of liquid or vapors with eyes causes burns.

3.3 **Treatment of Exposure:** INHALATION: remove victim to fresh air; give oxygen if breathing is difficult; call a physician. INGESTION: have victim drink water or milk; do NOT induce vomiting. SKIN OR EYES: immediately flush with plenty of water for at least 15 min; physician should see cases of eye irritation from vapor or liquid.

3.4 TLV-TWA: 2 ppm
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.

3.7 **Toxicity by Ingestion:** Grade 3; LD₅₀ = 50 to 500 mg/kg
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 vapor concentrations.

3.11 **Liquid or Solid Characteristics:** Fairly severe skin irritant; may cause pain and second- degree burns after a few minutes contact.

3.12 **Odor Threshold:** 0.13 ppm
3.13 **IDLH Value:** 50 ppm
3.14 **OSHA PEL-TWA:** 2 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:** 59°F O.C.
4.2 **Flammable Limits in Air:** 2.1%-15.5%
4.3 **Fire Extinguishing Agents:** Foam, dry chemical, carbon dioxide
4.4 **Fire Extinguishing Agents Not to Be Used:** Water may be ineffective on fire.
4.5 **Special Hazards of Combustion Products:** Vapors are very irritating to nose, eyes, and skin.
4.6 **Behavior in Fire:** Vapor is heavier than air and may travel considerable distance to a source of ignition and flash back.
4.7 **Auto Ignition Temperature:** 450°F
4.8 **Electrical Hazards:** Currently not available
4.9 **Burning Rate:** 3.3 mm/min.
4.10 **Adiabatic Flame Temperature:** Currently not available
4.11 **Stoichiometric Air to Fuel Ratio:** 25.0 (calc.)
4.12 **Flame Temperature:** Currently not available
4.13 **Combustion Molar Ratio (Reactant to Product):** 7.5 (calc.)
4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

7. SHIPPING INFORMATION

7.1 **Grades of Purity:** 98.0%
7.2 **Storage Temperature:** Ambient
7.3 **Inert Atmosphere:** No requirement
7.4 **Venting:** Pressure-vacuum
7.5 **IMO Pollution Category:** A
7.6 **Ship Type:** 2
7.7 **Barge Hull Type:** 2

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 **NAFPA Hazard Classification:**

Category	Classification
Health Hazard (Blue)	4
Flammability (Red)	3
Instability (Yellow)	2

8.6 **EPA Reportable Quantity:** 100 pounds
8.7 **EPA Pollution Category:** B
8.8 **RCRA Waste Number:** U053
8.9 **EPA FWPCA List:** Yes

5. CHEMICAL REACTIVITY

5.1 **Reactivity with Water:** Not flammable
5.2 **Reactivity with Common Materials:** No reaction
5.3 **Stability During Transport:** May polymerize
5.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
5.5 **Polymerization:** May polymerize or condense with evolution of heat in presence of alkalies, amines, or acids.
5.6 **Inhibitor of Polymerization:** None used

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 **Physical State at 15° C and 1 atm:** Liquid
9.2 **Molecular Weight:** 70.09
9.3 **Boiling Point at 1 atm:** 216.0°F = 102.2°C = 375.4°K
9.4 **Freezing Point:** -100°F = -75°C = 198°K
9.5 **Critical Temperature:** 563.0°F = 295°C = 569.2°K
9.6 **Critical Pressure:** 630 psia = 43 atm = 4.4 MN/m²
9.7 **Specific Gravity:** 0.852 at 20°C (liquid)
9.8 **Liquid Surface Tension:** Currently not available
9.9 **Liquid Water Interfacial Tension:** Currently not available
9.10 **Vapor (Gas) Specific Gravity:** 2.4
9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.104
9.12 **Latent Heat of Vaporization:** 200 Btu/lb = 111 cal/g = 4.65 X 10⁵ J/kg
9.13 **Heat of Combustion:** -14,000 Btu/lb = -7760 cal/g = -325 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:** 1.5 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
40	54.160	85	0.547	32	1.040	32	1.041
50	53.810	90	0.552	34	1.040	34	1.021
60	53.460	95	0.557	36	1.040	36	1.001
70	53.110	100	0.562	38	1.040	38	0.982
80	52.770	105	0.567	40	1.040	40	0.964
90	52.420	110	0.572	42	1.040	42	0.945
100	52.070	115	0.577	44	1.040	44	0.928
110	51.730	120	0.582	46	1.040	46	0.911
120	51.380	125	0.587	48	1.040	48	0.894
130	51.030	130	0.592	50	1.040	50	0.878
140	50.690	135	0.597	52	1.040	52	0.862
150	50.340	140	0.602	54	1.040	54	0.846
160	49.990	145	0.607	56	1.040	56	0.831
170	49.650	150	0.612	58	1.040	58	0.817
180	49.300			60	1.040	60	0.802
190	48.950			62	1.040	62	0.788
200	48.610			64	1.040	64	0.775
210	48.260			66	1.040	66	0.762
						68	0.749
						70	0.736
						72	0.724
						74	0.712
						76	0.700
						78	0.689
						80	0.677

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
68	15.500	40	0.241	40	0.00315	0	0.275
		50	0.335	50	0.00429	25	0.285
		60	0.458	60	0.00575	50	0.294
		70	0.617	70	0.00760	75	0.304
		80	0.820	80	0.00992	100	0.314
		90	1.076	90	0.01279	125	0.323
		100	1.396	100	0.01629	150	0.332
		110	1.791	110	0.02053	175	0.341
		120	2.274	120	0.02561	200	0.350
		130	2.858	130	0.03165	225	0.359
		140	3.561	140	0.03877	250	0.368
		150	4.397	150	0.04709	275	0.377
		160	5.386	160	0.05675	300	0.385
		170	6.547	170	0.06789	325	0.394
		180	7.901	180	0.08065	350	0.402
		190	9.470	190	0.09517	375	0.410
		200	11.280	200	0.11160	400	0.418
		210	13.350	210	0.13010	425	0.426
		220	15.700	220	0.15080	450	0.434
		230	18.370	230	0.17400	475	0.442
		240	21.390	240	0.19960	500	0.449
		250	24.770	250	0.22790	525	0.457
		260	28.560	260	0.25910	550	0.464
		270	32.770	270	0.29320	575	0.471
		280	37.440	280	0.33050	600	0.478