

ALLYL CHLOROFORMATE

ACF

| CAUTIONARY RESPONSE INFORMATION | | | | 4. FIRE HAZARDS | | 7. SHIPPING INFORMATION | | | | | | | | | |
|---|----------------|---------------|-----------|--|---|-------------------------|--|----------|----------------|---------------------------|---|-------------------------|---|---------------------------|---|
| Common Synonyms Allyl chlorocarbonate | | Watery liquid | Colorless | Extremely irritating odor | 4.1 Flash Point: 92°F O.C. 88°F C.C. 4.2 Flammable Limits in Air: Currently not available 4.3 Fire Extinguishing Agents: Dry chemical, foam, carbon dioxide 4.4 Fire Extinguishing Agents Not to Be Used: Water may be ineffective 4.5 Special Hazards of Combustion Products: When heated to decomposition, emits highly toxic phosgene gas. 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: Currently not available 4.8 Electrical Hazards: I, D 4.9 Burning Rate: 4.9 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 | | | | | | | | | | |
| Stop discharge if possible. Keep people away. Shut off ignition sources. Call fire department. Avoid inhalation. Isolate and remove discharged material. Notify local health and pollution control agencies. Protect water intakes. | | | | 7.1 Grades of Purity: Commercial, 97+% | | | | | | | | | | | |
| Fire 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). Extinguish with dry chemicals, foam or carbon dioxide. Water may be ineffective on fire. Cool exposed containers with water. | | | | 7.2 Storage Temperature: Keep cool 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 | | | | | | | | | | | |
| Exposure Call for medical aid. VAPOR Irritating to eyes, nose and throat. If inhaled will cause difficult breathing. Move victim to fresh air. If breathing is difficult, give oxygen. LIQUID Irritating to 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. | | | | 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: No 8.5 NFPA Hazard Classification: <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 15%;">Category</td> <td style="text-align: center;">Classification</td> </tr> <tr> <td style="text-align: center;">Health Hazard (Blue).....</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">Flammability (Red).....</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">Instability (Yellow).....</td> <td style="text-align: center;">1</td> </tr> </table> 8.6 EPA Reportable Quantity: Not listed 8.7 EPA Pollution Category: Not listed 8.8 RCRA Waste Number: Not listed 8.9 EPA FWCNA List: Not listed | | | | Category | Classification | Health Hazard (Blue)..... | 3 | Flammability (Red)..... | 3 | Instability (Yellow)..... | 1 |
| Category | Classification | | | | | | | | | | | | | | |
| Health Hazard (Blue)..... | 3 | | | | | | | | | | | | | | |
| Flammability (Red)..... | 3 | | | | | | | | | | | | | | |
| Instability (Yellow)..... | 1 | | | | | | | | | | | | | | |
| Water Pollution Effect of low concentrations on aquatic life is unknown. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes. | | | | 9. PHYSICAL & CHEMICAL PROPERTIES 9.1 Physical State at 15°C and 1 atm: Liquid 9.2 Molecular Weight: 120.5 9.3 Boiling Point at 1 atm: 235°F = 113°C = 386°K 9.4 Freezing Point: -112°F = -80°C = 193°K 9.5 Critical Temperature: Not pertinent 9.6 Critical Pressure: Not pertinent 9.7 Specific Gravity: 1.139 at 20°C (liquid) 9.8 Liquid Surface Tension: (est.) 25 dynes/cm = 0.025 N/m at 20°C 9.9 Liquid Water Interfacial Tension: Not pertinent 9.10 Vapor (Gas) Specific Gravity: 4.15 9.11 Ratio of Specific Heats of Vapor (Gas): 1.0804 9.12 Latent Heat of Vaporization: (est.) 100 Btu/lb = 56 cal/g = 2.3 X 10 ³ J/kg 9.13 Heat of Combustion: (est.) -7,800 Btu/lb = -4,300 cal/g = -180 X 10 ³ 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: Currently not available | | | | | | | | | | | |
| 1. CORRECTIVE RESPONSE ACTIONS Dilute and disperse small amounts Stop discharge Collection Systems: Pump; Dredge Chemical and Physical Treatment: Neutralize | | | | 6. WATER POLLUTION 6.1 Aquatic Toxicity: Currently not available 6.2 Waterfowl Toxicity: Currently not available 6.3 Biological Oxygen Demand (BOD): Currently not available 6.4 Food Chain Concentration Potential: None 6.5 GESAMP Hazard Profile: Bioaccumulation: 0 Damage to living resources: - Human Oral hazard: 2 Human Contact hazard: II Reduction of amenities: XXX | | | | | | | | | | | |
| 3. HEALTH HAZARDS 3.1 Personal Protective Equipment: Vapor-proof protective goggles and face shield; plastic or rubber gloves, shoes and clothing; gas mask or self-contained breathing apparatus. 3.2 Symptoms Following Exposure: Vapor irritates eyes and respiratory tract. Contact with liquid causes eye and skin irritation, and ingestion irritates mouth and stomach. 3.3 Treatment of Exposure: INHALATION: remove from exposure; support respiration if necessary; call physician. YES: if irritated by either vapor or liquid, flush with water for at least 15 min. SKIN: wash with large amounts of water for at least 15 min. INGESTION: do NOT induce vomiting; give water; call physician. 3.4 TLV-TWA: Not listed. 3.5 TLV-STEL: Not listed. 3.6 TLV-Ceiling: Not listed. 3.7 Toxicity by Ingestion: Grade 3; LD ₅₀ = 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: Vapors are 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: 1.4 ppm 3.13 IDLH Value: Not listed. 3.14 OSHA PEL-TWA: Not listed. 3.15 OSHA PEL-STEL: Not listed. 3.16 OSHA PEL-Ceiling: Not listed. 3.17 EPA AEGL: Not listed | | | | 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 |
| 34 | 72.339 | 34 | 0.450 | 34 | 1.048 | 34 | 0.958 |
| 36 | 72.270 | 36 | 0.450 | 36 | 1.048 | 36 | 0.940 |
| 38 | 72.200 | 38 | 0.450 | 38 | 1.048 | 38 | 0.923 |
| 40 | 72.129 | 40 | 0.450 | 40 | 1.048 | 40 | 0.906 |
| 42 | 72.059 | 42 | 0.450 | 42 | 1.048 | 42 | 0.889 |
| 44 | 71.990 | 44 | 0.450 | 44 | 1.048 | 44 | 0.873 |
| 46 | 71.919 | 46 | 0.450 | 46 | 1.048 | 46 | 0.858 |
| 48 | 71.849 | 48 | 0.450 | 48 | 1.048 | 48 | 0.842 |
| 50 | 71.790 | 50 | 0.450 | 50 | 1.048 | 50 | 0.827 |
| 52 | 71.719 | 52 | 0.450 | 52 | 1.048 | 52 | 0.813 |
| 54 | 71.650 | 54 | 0.450 | 54 | 1.048 | 54 | 0.799 |
| 56 | 71.580 | 56 | 0.450 | 56 | 1.048 | 56 | 0.785 |
| 58 | 71.509 | 58 | 0.450 | 58 | 1.048 | 58 | 0.772 |
| 60 | 71.440 | 60 | 0.450 | 60 | 1.048 | 60 | 0.758 |
| 62 | 71.370 | 62 | 0.450 | 62 | 1.048 | 62 | 0.746 |
| 64 | 71.299 | 64 | 0.450 | 64 | 1.048 | 64 | 0.733 |
| 66 | 71.230 | 66 | 0.450 | 66 | 1.048 | 66 | 0.721 |
| 68 | 71.160 | 68 | 0.450 | 68 | 1.048 | 68 | 0.709 |
| 70 | 71.089 | 70 | 0.450 | 70 | 1.048 | 70 | 0.698 |
| 72 | 71.020 | 72 | 0.450 | 72 | 1.048 | 72 | 0.686 |
| 74 | 70.950 | 74 | 0.450 | 74 | 1.048 | 74 | 0.675 |
| 76 | 70.879 | 76 | 0.450 | 76 | 1.048 | 76 | 0.664 |
| 78 | 70.809 | 78 | 0.450 | 78 | 1.048 | 78 | 0.654 |
| 80 | 70.750 | 80 | 0.450 | 80 | 1.048 | 80 | 0.644 |
| 82 | 70.679 | 82 | 0.450 | 82 | 1.048 | 82 | 0.633 |
| 84 | 70.610 | 84 | 0.450 | 84 | 1.048 | 84 | 0.624 |

| 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 |
| I | 60 | 4.950 | 60 | 0.10690 | 100 | 0.230 | |
| N | 65 | 5.538 | 65 | 0.11850 | 120 | 0.236 | |
| S | 70 | 6.182 | 70 | 0.13100 | 140 | 0.241 | |
| O | 75 | 6.888 | 75 | 0.14460 | 160 | 0.247 | |
| L | 80 | 7.658 | 80 | 0.15930 | 180 | 0.252 | |
| U | 85 | 8.498 | 85 | 0.17510 | 200 | 0.257 | |
| B | 90 | 9.413 | 90 | 0.19220 | 220 | 0.263 | |
| L | 95 | 10.410 | 95 | 0.21060 | 240 | 0.268 | |
| E | 100 | 11.480 | 100 | 0.23030 | 260 | 0.273 | |
| | 105 | 12.650 | 105 | 0.25150 | 280 | 0.278 | |
| | 110 | 13.910 | 110 | 0.27420 | 300 | 0.284 | |
| | 115 | 15.280 | 115 | 0.29840 | 320 | 0.289 | |
| | 120 | 16.750 | 120 | 0.32430 | 340 | 0.294 | |
| | | | | | 360 | 0.299 | |
| | | | | | 380 | 0.304 | |
| | | | | | 400 | 0.309 | |
| | | | | | 420 | 0.314 | |
| | | | | | 440 | 0.319 | |