

# CHLOROHYDRINS

CHD

CAUTIONARY RESPONSE INFORMATION			
Common Synonyms Crude epichlorohydrin	Watery liquid	Colorless to yellow	Garlic odor
Sinks and mixes with water. Poisonous vapor is produced.			
	<p>Keep people away. Avoid contact with liquid and vapor.            Wear goggles and self-contained breathing apparatus.            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>Combustible.            Containers may explode in fire.            Poisonous gases are produced in fire.            Wear goggles and self-contained breathing apparatus            Fight fire from a safe distance or protected location.            Extinguish with water, dry chemical, alcohol foam, or carbon dioxide.            Cool exposed containers with water.</p>		
Exposure	<p>CALL FOR MEDICAL AID.</p> <p>VAPOR            Poisonous if inhaled.            Irritating to eyes, nose and throat.            Move to fresh air.            If breathing has stopped, give artificial respiration.            If breathing is difficult, give oxygen.</p> <p>LIQUID            Poisonous if swallowed.            Irritating to skin and eyes.            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>		
Water Pollution	<p>Effect of low concentrations on aquatic life is unknown.            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	2. CHEMICAL DESIGNATIONS
Dilute and disperse Stop discharge Do not burn	<p>2.1 CG Compatibility Group: 17;            Epichlorohydrin</p> <p>2.2 Formula: O=C(CHCl<sub>2</sub>)Cl</p> <p>2.3 IMO/UN Designation: 6.1/2023</p> <p>2.4 DOT ID No.: 2023</p> <p>2.5 CAS Registry No.: 106-89-8</p> <p>2.6 NAERG Guide No.: 131P</p> <p>2.7 Standard Industrial Trade Classification: 51615</p>
3. HEALTH HAZARDS	
3.1 Personal Protective Equipment: Organic canister mask or air pack; protective goggles; protective gloves.	
3.2 Symptoms Following Exposure: May cause central nervous system depression. Vapor is irritating to eyes, nose and throat. Headache, nausea, vomiting, collapse if swallowed. Liquid irritates skin.	
3.3 Treatment of Exposure: INHALATION: remove to fresh air, keep warm and quiet. Get medical attention at once. If breathing stops, start artificial respiration. INGESTION: Induce vomiting and call physician. Do NOT induce vomiting if unconscious. No specific antidote known. EYES AND SKIN: Flush with water for at least 15 min. and get medical attention. Remove contaminated clothing and wash before reuse.	
3.4 TLV-TWA: 0.5 ppm	
3.5 TLV-STEL: Not listed.	
3.6 TLV-Ceiling: Not listed.	
3.7 Toxicity by Ingestion: Grade 3; LD <sub>50</sub> = 50-500 mg/kg	
3.8 Toxicity by Inhalation: Currently not available.	
3.9 Chronic Toxicity: Currently not available	
3.10 Vapor (Gas) Irritant Characteristics: Vapors cause moderate irritation such that personnel will find high concentrations unpleasant. The effect is temporary.	
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: 10 ppm	
3.13 IDLH Value: 75 ppm	
3.14 OSHA PEL-TWA: 5 ppm	
3.15 OSHA PEL-STEL: Not listed.	
3.16 OSHA PEL-Ceiling: Not listed.	
3.17 EPA AEGL: Not listed	

4. FIRE HAZARDS	7. SHIPPING INFORMATION
<p>4.1 Flash Point: 92°F O.C. 100°F C.C.</p> <p>4.2 Flammable Limits in Air: 3.8%-21%</p> <p>4.3 Fire Extinguishing Agents: Alcohol foam, dry chemical, carbon dioxide, water spray</p> <p>4.4 Fire Extinguishing Agents Not to Be Used: Avoid use of dry chemical if fire occurs in container with confined vent.</p> <p>4.5 Special Hazards of Combustion Products: Toxic irritating vapors are generated when heated.</p> <p>4.6 Behavior in Fire: Containers may explode in fire because of polymerization.</p> <p>4.7 Auto Ignition Temperature: 804°F</p> <p>4.8 Electrical Hazards: Currently not available</p> <p>4.9 Burning Rate: 2.6 mm/min.</p> <p>4.10 Adiabatic Flame Temperature: Currently not available</p> <p>4.11 Stoichiometric Air to Fuel Ratio: 16.7 (calc.)</p> <p>4.12 Flame Temperature: Currently not available</p> <p>4.13 Combustion Molar Ratio (Reactant to Product): 6.0 (calc.)</p> <p>4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed</p>	<p>7.1 Grades of Purity: 90% epichlorohydrin, the balance being water (2.5%), 1, 2, 3-, trichloropropene (5%), glycerol (1.8%), isopropyl chloride (0.5%), n-propyl chloride (0.8%) and others (1.0%).</p> <p>7.2 Storage Temperature: Ambient</p> <p>7.3 Inert Atmosphere: No requirement</p> <p>7.4 Venting: Pressure-vacuum</p> <p>7.5 IMO Pollution Category: (D)</p> <p>7.6 Ship Type: 2</p> <p>7.7 Barge Hull Type: 1</p>
8. HAZARD CLASSIFICATIONS	
8.1 49 CFR Category: Poison	Category Classification
8.2 49 CFR Class: 6.1	Health Hazard (Blue)..... 3
8.3 49 CFR Package Group: II	Flammability (Red)..... 3
8.4 Marine Pollutant: No	Instability (Yellow)..... 2
8.5 NFPA Hazard Classification:	
	Category Classification
	Health Hazard (Blue)..... 3
	Flammability (Red)..... 3
	Instability (Yellow)..... 2
8.6 EPA Reportable Quantity: Not listed.	
8.7 EPA Pollution Category: Not listed.	
8.8 RCRA Waste Number: Not listed	
8.9 EPA FWPCA List: Not listed	
5. CHEMICAL REACTIVITY	9. PHYSICAL & CHEMICAL PROPERTIES
5.1 Reactivity with Water: Mild reaction; not likely to be hazardous	9.1 Physical State at 15°C and 1 atm: Liquid
5.2 Reactivity with Common Materials: No reaction	9.2 Molecular Weight: Not pertinent
5.3 Stability During Transport: Stable	9.3 Boiling Point at 1 atm: Not pertinent
5.4 Neutralizing Agents for Acids and Caustics: Not pertinent	9.4 Freezing Point: Not pertinent
5.5 Polymerization: Can polymerize in presence of strong acids and bases, particularly when hot	9.5 Critical Temperature: Not pertinent
5.6 Inhibitor of Polymerization: None	9.6 Critical Pressure: Not pertinent
6. WATER POLLUTION	9.7 Specific Gravity: 1.18 at 20°C (liquid)
6.1 Aquatic Toxicity: Currently not available	9.8 Liquid Surface Tension: Not pertinent
6.2 Waterfowl Toxicity: Currently not available	9.9 Liquid Water Interfacial Tension: Not pertinent
6.3 Biological Oxygen Demand (BOD): Currently not available	9.10 Vapor (Gas) Specific Gravity: Not pertinent
6.4 Food Chain Concentration Potential: None	9.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent
6.5 GESAMP Hazard Profile: Not listed	9.12 Latent Heat of Vaporization: (est.) 142 Btu/lb = 78.8 cal/g = 3.30 X 10 <sup>3</sup> J/kg
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
32	73.660	85	0.336		N		NOT
34	73.660	90	0.341		O		NOT
36	73.660	95	0.346		T		PERTINENT
38	73.660	100	0.350		P		PERTINENT
40	73.660	105	0.355		E		PERTINENT
42	73.660	110	0.359		R		PERTINENT
44	73.660	115	0.364		I		PERTINENT
46	73.660	120	0.368		N		PERTINENT
48	73.660	125	0.373		E		PERTINENT
50	73.660	130	0.378		N		PERTINENT
52	73.660	135	0.382		E		PERTINENT
54	73.660	140	0.387		N		PERTINENT
56	73.660	145	0.391		E		PERTINENT
58	73.660	150	0.396		N		PERTINENT
60	73.660						
62	73.660						
64	73.660						
66	73.660						
68	73.660						
70	73.660						
72	73.660						
74	73.660						
76	73.660						
78	73.660						
80	73.660						

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
77	6.000	35	0.029		C		CURRENTLY
		40	0.036		U		CURRENTLY
		45	0.044		R		NOT AVAILABLE
		50	0.054		E		NOT AVAILABLE
		55	0.065		N		NOT AVAILABLE
		60	0.079		O		NOT AVAILABLE
		65	0.095		T		NOT AVAILABLE
		70	0.114		A		NOT AVAILABLE
		75	0.137		V		NOT AVAILABLE
		80	0.163		I		NOT AVAILABLE
		85	0.194		B		NOT AVAILABLE
		90	0.230		L		NOT AVAILABLE
		95	0.273		A		NOT AVAILABLE
		100	0.321		V		NOT AVAILABLE
		105	0.378		I		NOT AVAILABLE
		110	0.443		B		NOT AVAILABLE
		115	0.518		L		NOT AVAILABLE
		120	0.604		A		NOT AVAILABLE
		125	0.702		V		NOT AVAILABLE
		130	0.814		I		NOT AVAILABLE
		135	0.942		B		NOT AVAILABLE
		140	1.087		L		NOT AVAILABLE
		145	1.252		A		NOT AVAILABLE
		150	1.438		V		NOT AVAILABLE
		155	1.648		I		NOT AVAILABLE
		160	1.885		B		NOT AVAILABLE