

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.
Fire 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.	
Exposure	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.
Water Pollution	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.

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge
Do not burn

2. CHEMICAL DESIGNATIONS

- 2.1 CG Compatibility Group: 17;
Epichlorohydrin
2.2 Formula: $\text{O CH}_2\text{CHCH}_2\text{Cl}$
2.3 IMO/UN Designation: 6.1/2023
2.4 DOT ID No.: 2023
2.5 CAS Registry No.: 106-89-8
2.6 NAERG Guide No.: 131P
2.7 Standard Industrial Trade Classification:
51615

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_{50} = 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

- 4.1 **Flash Point:** 92°F O.C. 100°F C.C.
4.2 **Flammable Limits in Air:** 3.8%-21%
4.3 **Fire Extinguishing Agents:** Alcohol foam, dry chemical, carbon dioxide, water spray
4.4 **Fire Extinguishing Agents Not to Be Used:** Avoid use of dry chemical if fire occurs in container with confined vent.
4.5 **Special Hazards of Combustion Products:** Toxic irritating vapors are generated when heated.
4.6 **Behavior in Fire:** Containers may explode in fire because of polymerization.
4.7 **Auto Ignition Temperature:** 804°F
4.8 **Electrical Hazards:** Currently not available
4.9 **Burning Rate:** 2.6 mm/min.
4.10 **Adiabatic Flame Temperature:** Currently not available
4.11 **Stoichiometric Air to Fuel Ratio:** 16.7 (calc.)
4.12 **Flame Temperature:** Currently not available
4.13 **Combustion Molar Ratio (Reactant to Product):** 6.0 (calc.)
4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** Mild reaction; not likely to be hazardous
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:** Can polymerize in presence of strong acids and bases, particularly when hot
5.6 **Inhibitor of Polymerization:** None

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:** Not listed

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** 90% epichlorohydrin, the balance being water (2.5%), 1, 2, 3-trichloropropane (5%), glycerol (1.8%), isopropyl chloride (0.5%), n-propyl chloride (0.8%) and others (1.0%).
7.2 **Storage Temperature:** Ambient
7.3 **Inert Atmosphere:** No requirement
7.4 **Venting:** Pressure-vacuum
7.5 **IMO Pollution Category:** (D)
7.6 **Ship Type:** 2
7.7 **Barge Hull Type:** 1

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Poison
8.2 **49 CFR Class:** 6.1
8.3 **49 CFR Package Group:** II
8.4 **Marine Pollutant:** No
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

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Liquid
9.2 **Molecular Weight:** Not pertinent
9.3 **Boiling Point at 1 atm:** Not pertinent
9.4 **Freezing Point:** Not pertinent
9.5 **Critical Temperature:** Not pertinent
9.6 **Critical Pressure:** Not pertinent
9.7 **Specific Gravity:** 1.18 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:** Not pertinent
9.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
9.12 **Latent Heat of Vaporization:** (est.) 142 Btu/lb = 78.8 cal/g = 3.30×10^5 J/kg
9.13 **Heat of Combustion:** (approx.) -8,100 Btu/lb = -4500 cal/g = -190×10^5 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:** 0.3 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
32	73.660	85	0.336		N		N
34	73.660	90	0.341		O		O
36	73.660	95	0.346		T		T
38	73.660	100	0.350				
40	73.660	105	0.355		P		P
42	73.660	110	0.359		E		E
44	73.660	115	0.364		R		R
46	73.660	120	0.368		T		T
48	73.660	125	0.373		I		I
50	73.660	130	0.378		N		N
52	73.660	135	0.382		E		E
54	73.660	140	0.387		N		N
56	73.660	145	0.391		T		T
58	73.660	150	0.396				
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		C
		40	0.036		U		U
		45	0.044		R		R
		50	0.054		R		R
		55	0.065		E		E
		60	0.079		N		N
		65	0.095		T		T
		70	0.114		L		L
		75	0.137		Y		Y
		80	0.163				
		85	0.194		N		N
		90	0.230		O		O
		95	0.273		T		T
		100	0.321				
		105	0.378		A		A
		110	0.443		V		V
		115	0.518		A		A
		120	0.604		I		I
		125	0.702		L		L
		130	0.814		A		A
		135	0.942		B		B
		140	1.087		L		L
		145	1.252		E		E
		150	1.438				
		155	1.648				
		160	1.885				