

4-CHLOROBUTYRONITRILE

CBN

CAUTIONARY RESPONSE INFORMATION

Common Synonyms	Liquid White to light yellow Sinks in water.
<p>Keep people away. Call fire department. Avoid contact with liquid. Notify local health and pollution control agencies. Protect water intakes.</p>	
Fire	<p>Combustible. POISONOUS GASES MAY BE PRODUCED IN FIRE. Irritating gases may be produced when heated. Wear goggles and self-contained breathing apparatus. Extinguish with water, dry chemicals, foam, or carbon dioxide.</p>
Exposure	<p>CALL FOR MEDICAL AID.</p> <p>VAPOR Irritating to eyes, nose and throat. If inhaled will cause coughing or difficult breathing. If in eyes, hold eyelids open and flush with plenty of water. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.</p> <p>LIQUID Irritating to skin and eyes. If swallowed will cause nausea and vomiting. 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 wildlife officials. Notify operators of nearby water intakes.</p>

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge
Collection Systems: Pump; Dredge

2. CHEMICAL DESIGNATIONS

2.1 **CG Compatibility Group:** Not listed.
2.2 **Formula:** $\text{CH}_2\text{ClCH}_2\text{CH}_2\text{CN} + \text{CH}_2\text{BrCH}_2\text{CH}_2\text{CN}$
2.3 **IMO/UN Designation:** Not listed
2.4 **DOT ID No.:** Not listed
2.5 **CAS Registry No.:** Currently not available
2.6 **NAERG Guide No.:** Not listed
2.7 **Standard Industrial Trade Classification:** 51484

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Air supply mask or self-contained breathing apparatus for repeated handling large amounts; rubber gloves; safety goggles
- 3.2 **Symptoms Following Exposure:** Chemical is moderately toxic. Inhalation causes irritation of nose and throat. Ingestion causes irritation of mouth and stomach. Contact with eyes causes irritation. Can penetrate the skin on prolonged contact; only slightly irritating.
- 3.3 **Treatment of Exposure:** INHALATION: move victim to fresh air; administer artificial respiration if required; call a doctor. INGESTION: give large amount of water; induce vomiting. EYES: flush with water for at least 15 min. SKIN: flush with plenty of water.
- 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; $\text{LD}_{50} = 50\text{-}400 \text{ mg/kg}$ (rat)
3.8 **Toxicity by Inhalation:** Currently not available.
3.9 **Chronic Toxicity:** Currently not available
3.10 **Vapor (Gas) Irritant Characteristics:** Currently not available
3.11 **Liquid or Solid Characteristics:** Currently not available
3.12 **Odor Threshold:** Currently not available
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

4. FIRE HAZARDS

- 4.1 **Flash Point:** Currently not available
4.2 **Flammable Limits in Air:** Currently not available
4.3 **Fire Extinguishing Agents:** Water, dry chemical, foam, carbon dioxide
4.4 **Fire Extinguishing Agents Not to Be Used:** Currently not available
4.5 **Special Hazards of Combustion Products:** Toxic and irritating hydrogen cyanide, hydrogen bromide, and hydrogen chloride may form in fires.
4.6 **Behavior in Fire:** Currently not available
4.7 **Auto Ignition Temperature:** Currently not available
4.8 **Electrical Hazards:** Currently not available
4.9 **Burning Rate:** Currently not available
4.10 **Adiabatic Flame Temperature:** Currently not available
4.11 **Stoichiometric Air to Fuel Ratio:** 29.8 (calc.)
4.12 **Flame Temperature:** Currently not available
4.13 **Combustion Molar Ratio (Reactant to Product):** 9.5 (calc.)
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:** May attack some forms of plastics.
5.3 **Stability During Transport:** Stable
5.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
5.5 **Polymerization:** Not pertinent
5.6 **Inhibitor of Polymerization:** Not pertinent

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:** 50%, + 40% 4-bromobutyronitrile + 8% glutaronitrile. Major components have same hazard ratings.
7.2 **Storage Temperature:** Ambient
7.3 **Inert Atmosphere:** No requirement
7.4 **Venting:** Open
7.5 **IMO Pollution Category:** Currently not available
7.6 **Ship Type:** Currently not available
7.7 **Barge Hull Type:** Currently not available

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Not listed
8.2 **49 CFR Class:** Not pertinent
8.3 **49 CFR Package Group:** Not listed.
8.4 **Marine Pollutant:** No
8.5 **NFPA Hazard Classification:** Not listed
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:** 103.55
9.3 **Boiling Point at 1 atm:** $374^\circ\text{F} = 190^\circ\text{C} = 463^\circ\text{K}$
9.4 **Freezing Point:** Not pertinent
9.5 **Critical Temperature:** Not pertinent
9.6 **Critical Pressure:** Not pertinent
9.7 **Specific Gravity:** 1.22 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:** 3.57
9.11 **Ratio of Specific Heats of Vapor (Gas):** (est.) 1.080 at 20°C
9.12 **Latent Heat of Vaporization:** (est.) 185 Btu/lb = 103 cal/g = $4.31 \times 10^5 \text{ J/kg}$
9.13 **Heat of Combustion:** Currently not available
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

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
42	77.059		N O T		N O T		N O T
44	76.990						
46	76.919						
48	76.849						
50	76.780		P E R T I N E N T		P E R T I N E N T		P E R T I N E N T
52	76.709						
54	76.639						
56	76.570						
58	76.500						
60	76.429						
62	76.360						
64	76.290						
66	76.219						
68	76.150						
70	76.089						
72	76.029						
74	75.950						
76	75.879						

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 N S O L U B I L E		160	0.202	160	0.00315	0	0.240
		170	0.263	170	0.00404	20	0.246
		180	0.341	180	0.00514	40	0.252
		190	0.437	190	0.00649	60	0.258
		200	0.556	200	0.00814	80	0.263
		210	0.703	210	0.01013	100	0.269
		220	0.883	220	0.01253	120	0.274
		230	1.101	230	0.01540	140	0.280
		240	1.365	240	0.01881	160	0.285
		250	1.681	250	0.02285	180	0.290
		260	2.058	260	0.02759	200	0.295
		270	2.507	270	0.03314	220	0.301
		280	3.037	280	0.03960	240	0.306
		290	3.660	290	0.04709	260	0.311
		300	4.389	300	0.05573	280	0.316
		310	5.239	310	0.06566	300	0.320
		320	6.225	320	0.07701	320	0.325
		330	7.364	330	0.08996	340	0.330
		340	8.675	340	0.10460	360	0.335
		350	10.180	350	0.12130	380	0.339
		360	11.900	360	0.14000	400	0.344
		370	13.850	370	0.16100	420	0.348
						440	0.352
						460	0.357
						480	0.361
						500	0.365