

# 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><b>VAPOR</b> 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><b>LIQUID</b> 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	2. CHEMICAL DESIGNATIONS
Dilute and disperse Stop discharge Collection Systems: Pump; Dredge	<p><b>2.1 CG Compatibility Group:</b> Not listed.</p> <p><b>2.2 Formula:</b> <chem>CH2ClCH2CH2CN + CH2BrCH2CH2CN</chem></p> <p><b>2.3 IMO/UN Designation:</b> Not listed</p> <p><b>2.4 DOT ID No.:</b> Not listed</p> <p><b>2.5 CAS Registry No.:</b> Currently not available</p> <p><b>2.6 NAERG Guide No.:</b> Not listed</p> <p><b>2.7 Standard Industrial Trade Classification:</b> 51484</p>
<b>3. HEALTH HAZARDS</b>	
<p><b>3.1 Personal Protective Equipment:</b> Air supply mask or self-contained breathing apparatus for repeated handling large amounts; rubber gloves; safety goggles</p> <p><b>3.2 Symptoms Following Exposure:</b> 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.</p> <p><b>3.3 Treatment of Exposure:</b> 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.</p> <p><b>3.4 TLV-TWA:</b> Not listed.</p> <p><b>3.5 TLV-STEL:</b> Not listed.</p> <p><b>3.6 TLV-Ceiling:</b> Not listed.</p> <p><b>3.7 Toxicity by Ingestion:</b> Grade 3; LD<sub>50</sub> = 50-400 mg/kg (rat)</p> <p><b>3.8 Toxicity by Inhalation:</b> Currently not available</p> <p><b>3.9 Chronic Toxicity:</b> Currently not available</p> <p><b>3.10 Vapor (Gas) Irritancy Characteristics:</b> Currently not available</p> <p><b>3.11 Liquid or Solid Characteristics:</b> Currently not available</p> <p><b>3.12 Odor Threshold:</b> Currently not available</p> <p><b>3.13 IDLH Value:</b> Not listed.</p> <p><b>3.14 OSHA PEL-TWA:</b> Not listed.</p> <p><b>3.15 OSHA PEL-STEL:</b> Not listed.</p> <p><b>3.16 OSHA PEL-Ceiling:</b> Not listed.</p> <p><b>3.17 EPA AEGL:</b> Not listed</p>	

4. FIRE HAZARDS	7. SHIPPING INFORMATION
<b>4.1 Flash Point:</b> Currently not available	<b>7.1 Grades of Purity:</b> 50%, + 40% 4-bromobutyronitrile + 8% glutaronitrile. Major components have same hazard ratings.
<b>4.2 Flammable Limits in Air:</b> Currently not available	<b>7.2 Storage Temperature:</b> Ambient
<b>4.3 Fire Extinguishing Agents:</b> Water, dry chemical, foam, carbon dioxide	<b>7.3 Inert Atmosphere:</b> No requirement
<b>4.4 Fire Extinguishing Agents Not to Be Used:</b> Currently not available	<b>7.4 Venting:</b> Open
<b>4.5 Special Hazards of Combustion Products:</b> Toxic and irritating hydrogen cyanide, hydrogen bromide, and hydrogen chloride may form in fires.	<b>7.5 IMO Pollution Category:</b> Currently not available
<b>4.6 Behavior in Fire:</b> Currently not available	<b>7.6 Ship Type:</b> Currently not available
<b>4.7 Auto Ignition Temperature:</b> Currently not available	<b>7.7 Barge Hull Type:</b> Currently not available
<b>4.8 Electrical Hazards:</b> Currently not available	<b>8. HAZARD CLASSIFICATIONS</b>
<b>4.9 Burning Rate:</b> Currently not available	<b>8.1 49 CFR Category:</b> Not listed
<b>4.10 Adiabatic Flame Temperature:</b> Currently not available	<b>8.2 49 CFR Class:</b> Not pertinent
<b>4.11 Stoichiometric Air to Fuel Ratio:</b> 29.8 (calc.)	<b>8.3 49 CFR Package Group:</b> Not listed
<b>4.12 Flame Temperature:</b> Currently not available	<b>8.4 Marine Pollutant:</b> No
<b>4.13 Combustion Molar Ratio (Reactant to Product):</b> 9.5 (calc.)	<b>8.5 NFPA Hazard Classification:</b> Not listed
<b>4.14 Minimum Oxygen Concentration for Combustion (MOCC):</b> Not listed	<b>8.6 EPA Reportable Quantity:</b> Not listed
<b>9. PHYSICAL &amp; CHEMICAL PROPERTIES</b>	
<b>9.1 Physical State at 15°C and 1 atm:</b> Liquid	
<b>9.2 Molecular Weight:</b> 103.55	
<b>9.3 Boiling Point at 1 atm:</b> 374°F = 190°C = 463°K	
<b>9.4 Freezing Point:</b> Not pertinent	
<b>9.5 Critical Temperature:</b> Not pertinent	
<b>9.6 Critical Pressure:</b> Not pertinent	
<b>9.7 Specific Gravity:</b> 1.22 at 20°C (liquid)	
<b>9.8 Liquid Surface Tension:</b> Currently not available	
<b>9.9 Liquid Water Interfacial Tension:</b> Currently not available	
<b>9.10 Vapor (Gas) Specific Gravity:</b> 3.57	
<b>9.11 Ratio of Specific Heats of Vapor (Gas):</b> (est.) 1.080 at 20°C	
<b>9.12 Latent Heat of Vaporization:</b> (est.) 185 Btu/lb = 103 cal/g = 4.31 X 10 <sup>5</sup> J/kg	
<b>9.13 Heat of Combustion:</b> Currently not available	
<b>9.14 Heat of Decomposition:</b> Not pertinent	
<b>9.15 Heat of Solution:</b> Not pertinent	
<b>9.16 Heat of Polymerization:</b> Not pertinent	
<b>9.17 Heat of Fusion:</b> Currently not available	
<b>9.18 Limiting Value:</b> Currently not available	
<b>9.19 Reid Vapor Pressure:</b> 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		N		N
44	76.990		O		O		O
46	76.919		T		T		T
48	76.849						
50	76.780		P		P		P
52	76.709		E		E		E
54	76.639		R		R		R
56	76.570		T		T		T
58	76.500		I		I		I
60	76.429		N		N		N
62	76.360		E		E		E
64	76.290		N		N		N
66	76.219		E		E		E
68	76.150		N		N		N
70	76.089		T		T		T
72	76.020						
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	160	0.202	160	0.00315	0	0.240	
N	170	0.263	170	0.00404	20	0.246	
S	180	0.341	180	0.00514	40	0.252	
O	190	0.437	190	0.00649	60	0.258	
L	200	0.556	200	0.00814	80	0.263	
U	210	0.703	210	0.01013	100	0.269	
B	220	0.883	220	0.01253	120	0.274	
L	230	1.101	230	0.01540	140	0.280	
E	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	