

N-BUTYL MERCAPTAN

BTM

CAUTIONARY RESPONSE INFORMATION

Common Synonyms		Liquid	Colorless to yellow	Skunk like odor
1-Butanethiol Thiobutyl alcohol		Floats on water. Poisonous vapor is produced.		
<p>Restrict access. AVOID CONTACT WITH LIQUID AND VAPOR. Wear goggles and self-contained breathing apparatus. Shut off ignition sources. Call fire department. Evacuate area in case of large discharge. Notify local health and pollution control agencies. Protect water intakes.</p>				
Fire	<p>FLAMMABLE. Irritating gases may be produced when heated. Containers may explode in fire. Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Extinguish with dry chemicals, alcohol foam, or carbon dioxide. Water may be ineffective on fire. Cool exposed containers with water.</p>			
Exposure	<p>CALL FOR MEDICAL AID.</p> <p>VAPOR POISONOUS IF INHALED. Irritating to eyes. Move victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.</p> <p>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 and have victim induce vomiting. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.</p>			
Water Pollution	<p>HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS. Fouling to shoreline. 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

Stop discharge
Clean shore line
Do not burn

2. CHEMICAL DESIGNATIONS

2.1 **CG Compatibility Group:** Not listed.
2.2 **Formula:** CH₃CH₂CH₂CH₂SH
2.3 **IMO/UN Designation:** 3.1/2347
2.4 **DOT ID No.:** 2347
2.5 **CAS Registry No.:** 109-79-5
2.6 **NAERG Guide No.:** 130
2.7 **Standard Industrial Trade Classification:** 51549

3. HEALTH HAZARDS

3.1 **Personal Protective Equipment:** Plastic gloves, goggles; self-contained breathing apparatus.
3.2 **Symptoms Following Exposure:** Inhalation causes loss of sense of smell; muscular weakness, convulsions, and respiratory paralysis may follow prolonged exposure. Contact of liquid with eyes or skin causes slight irritation. Ingestion causes nausea.
3.3 **Treatment of Exposure:** **INHALATION:** remove victim from contaminated atmosphere, give artificial respiration and oxygen if needed; observe for signs of pulmonary edema. **EYES:** wash with plenty of water; see a physician. **SKIN:** wash with soap and water. **INGESTION:** induce vomiting and follow with gastric lavage.
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 2; oral LD₅₀ = 1,500 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:** 0.001 ppm
3.13 **IDLH Value:** 500 ppm
3.14 **OSHA PEL-TWA:** 10 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:** 55°F O.C.
4.2 **Flammable Limits in Air:** Currently not available
4.3 **Fire Extinguishing Agents:** Dry chemical, alcohol foam, carbon dioxide
4.4 **Fire Extinguishing Agents Not to Be Used:** Water
4.5 **Special Hazards of Combustion Products:** Irritating sulfur dioxide may form.
4.6 **Behavior in Fire:** Vapors are heavier than air and may travel long distance to a source of ignition and flash back.
4.7 **Auto Ignition Temperature:** Currently not available
4.8 **Electrical Hazards:** Currently not available
4.9 **Burning Rate:** 7.4 mm/min.
4.10 **Adiabatic Flame Temperature:** Currently not available
4.11 **Stoichiometric Air to Fuel Ratio:** 35.7 (calc.)
4.12 **Flame Temperature:** Currently not available
4.13 **Combustion Molar Ratio (Reactant to Product):** 10.0 (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:** Strong oxidizers
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:** 7.3 mg/l/24 hr/fish/TL₅₀/fresh water
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: T
Damage to living resources: 3
Human Oral hazard: 1
Human Contact hazard: -
Reduction of amenities: XXX

7. SHIPPING INFORMATION

7.1 **Grades of Purity:** 98+%
7.2 **Storage Temperature:** Ambient
7.3 **Inert Atmosphere:** No requirement
7.4 **Venting:** Stable
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:** Flammable liquid
8.2 **49 CFR Class:** 3
8.3 **49 CFR Package Group:** II
8.4 **Marine Pollutant:** Yes
8.5 **NFPA Hazard Classification:**

Category	Classification
Health Hazard (Blue).....	2
Flammability (Red).....	3
Instability (Yellow).....	0

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:** 90.2
9.3 **Boiling Point at 1 atm:** 229.3°F = 98.5°C = 317.7°K
9.4 **Freezing Point:** -176.2°F = -115.7°C = 157.5°K
9.5 **Critical Temperature:** 554.0°F = 290°C = 563.2°K
9.6 **Critical Pressure:** 572 psia = 38.9 atm = 3.94 MN/m²
9.7 **Specific Gravity:** 0.841 at 20°C (liquid)
9.8 **Liquid Surface Tension:** 26.1 dynes/cm = 0.0261 N/m at 20°C
9.9 **Liquid Water Interfacial Tension:** 30 dynes/cm = 0.030 Nm at 20°C
9.10 **Vapor (Gas) Specific Gravity:** 6.5
9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.0770 at 16°C
9.12 **Latent Heat of Vaporization:** 154.0 Btu/lb = 85.58 cal/g = 3.583 X 10⁵ J/kg
9.13 **Heat of Combustion:** -16,601 Btu/lb = -9,223 cal/g = -386 X 10⁶ 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

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	53.740	34	0.441	51	1.048	52	0.548
36	53.670	36	0.442	52	1.048	54	0.541
38	53.600	38	0.443	53	1.048	56	0.534
40	53.530	40	0.444	54	1.048	58	0.527
42	53.460	42	0.446	55	1.048	60	0.520
44	53.390	44	0.447	56	1.048	62	0.514
46	53.320	46	0.448	57	1.048	64	0.508
48	53.250	48	0.449	58	1.048	66	0.501
50	53.180	50	0.450	59	1.048	68	0.495
52	53.110	52	0.451	60	1.048	70	0.489
54	53.040	54	0.452	61	1.048	72	0.484
56	52.980	56	0.453	62	1.048	74	0.478
58	52.910	58	0.454	63	1.048	76	0.472
60	52.840	60	0.456	64	1.048	78	0.467
62	52.770	62	0.457	65	1.048	80	0.461
64	52.700	64	0.458	66	1.048	82	0.456
66	52.630	66	0.459	67	1.048	84	0.451
68	52.560	68	0.460	68	1.048	86	0.446
70	52.490	70	0.461	69	1.048		
72	52.420	72	0.462	70	1.048		
74	52.350	74	0.463	71	1.048		
76	52.280	76	0.464	72	1.048		
78	52.210	78	0.466	73	1.048		
80	52.140	80	0.467	74	1.048		
82	52.070	82	0.468	75	1.048		
84	52.000	84	0.469	76	1.048		

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	0.518	60	0.00838	30	0.269
	N	70	0.687	70	0.01091	35	0.273
	S	80	0.903	80	0.01406	40	0.278
	O	90	1.174	90	0.01794	45	0.283
	L	100	1.512	100	0.02270	50	0.288
	U	110	1.930	110	0.02847	55	0.293
	B	120	2.444	120	0.03542	60	0.298
	L	130	3.069	130	0.04373	65	0.303
	E	140	3.825	140	0.05359	70	0.308
		150	4.732	150	0.06523	75	0.313
		160	5.816	160	0.07886	80	0.318
		170	7.100	170	0.09475	85	0.323
		180	8.614	180	0.11320	90	0.328
		190	10.390	190	0.13440	95	0.333
		200	12.460	200	0.15870	100	0.338
		210	14.860	210	0.18650	105	0.342
						110	0.347
						115	0.352
						120	0.357
						125	0.362
						130	0.367
						135	0.372
						140	0.377
						145	0.382
						150	0.387
						155	0.392