

N-BUTYLAMINE

BAM

CAUTIONARY RESPONSE INFORMATION				4. FIRE HAZARDS	7. SHIPPING INFORMATION								
Common Synonyms 1-Aminobutane Butylamine Mono-n-Butylamine Norvalamine	Liquid Mixes with water.	Colorless 	Fishy, ammonia-like odor 	4.1 Flash Point: 30°F O.C. 10°F C.C. 4.2 Flammable Limits in Air: 1.7%-9.8% 4.3 Fire Extinguishing Agents: "Alcohol" foam, dry chemical, carbon dioxide 4.4 Fire Extinguishing Agents Not to Be Used: Water may be ineffective. 4.5 Special Hazards of Combustion Products: Toxic oxides of nitrogen may form in fire. 4.6 Behavior in Fire: Vapor is heavier than air and may travel to a source of ignition and flash back. Containers may explode in fire. 4.7 Auto Ignition Temperature: 594°F 4.8 Electrical Hazards: Currently not available 4.9 Burning Rate: 5.79 mm/min. 4.10 Adiabatic Flame Temperature: Currently not available 4.11 Stoichiometric Air to Fuel Ratio: 36.9 (calc.) 4.12 Flame Temperature: Currently not available 4.13 Combustion Molar Ratio (Reactant to Product): 10.5 (calc.) 4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed	7.1 Grades of Purity: Pure, 100% 7.2 Storage Temperature: Ambient 7.3 Inert Atmosphere: No requirement 7.4 Venting: Open (flame arrester) 7.5 IMO Pollution Category: C 7.6 Ship Type: 2 7.7 Barge Hull Type: 2								
Restrict access. Evacuate. AVOID CONTACT WITH LIQUID AND VAPOR. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Shut off ignition sources. Call fire department. Stay upwind. Use water spray to "knock down" vapor. Notify local health and pollution control agencies. Protect water intakes.				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: <table border="0"> <tr> <th>Category</th> <th>Classification</th> </tr> <tr> <td>Health Hazard (Blue).....</td> <td>2</td> </tr> <tr> <td>Flammability (Red).....</td> <td>3</td> </tr> <tr> <td>Instability (Yellow).....</td> <td>0</td> </tr> </table>	Category	Classification	Health Hazard (Blue).....	2	Flammability (Red).....	3	Instability (Yellow).....	0	8. EPA Reportable Quantity: 1000 pounds 8.7 EPA Pollution Category: C 8.8 RCRA Waste Number: Not listed 8.9 EPA FWCNA List: Yes
Category	Classification												
Health Hazard (Blue).....	2												
Flammability (Red).....	3												
Instability (Yellow).....	0												
Fire Flammable. POISONOUS GASES MAY BE PRODUCED IN FIRE. Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Wear goggles and self-contained breathing apparatus. Extinguish with dry chemicals, foam, or carbon dioxide. Water may be ineffective on fire. Cool exposed containers with water.	Exposure CALL FOR MEDICAL AID. VAPOR POISONOUS IF INHALED OR IF SKIN IS EXPOSED. If inhaled will cause dizziness, headache, 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. LIQUID Will burn 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. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS do nothing except keep victim warm.		5. CHEMICAL REACTIVITY 5.1 Reactivity with Water: No reaction 5.2 Reactivity with Common Materials: May corrode some metals in presence of water. 5.3 Stability During Transport: Stable 5.4 Neutralizing Agents for Acids and Caustics: Flush with water 5.5 Polymerization: Not pertinent 5.6 Inhibitor of Polymerization: Not pertinent	9. PHYSICAL & CHEMICAL PROPERTIES 9.1 Physical State at 15°C and 1 atm: Liquid 9.2 Molecular Weight: 73.14 9.3 Boiling Point at 1 atm: 171.3°F = 77.4°C = 350.6°K 9.4 Freezing Point: -56°F = -49°C = 224°K 9.5 Critical Temperature: 483.8°F = 251°C = 524.2°K 9.6 Critical Pressure: 603 psia = 41 atm = 4.16 MN/m² 9.7 Specific Gravity: 0.741 at 20°C (liquid) 9.8 Liquid Surface Tension: 53.11 dynes/cm = 0.05311 N/m at 20°C 9.9 Liquid Water Interfacial Tension: Not pertinent 9.10 Vapor (Gas) Specific Gravity: 2.5 9.11 Ratio of Specific Heats of Vapor (Gas): (est.) 1.071 9.12 Latent Heat of Vaporization: 180 Btu/lb = 100 cal/g = 4.2 X 10³ J/kg 9.13 Heat of Combustion: -17,595 Btu/lb = -9,775 cal/g = -409.0 X 10³ J/kg 9.14 Heat of Decomposition: Not pertinent 9.15 Heat of Solution: -137 Btu/lb = -76.2 cal/g = -3.19 X 10³ J/kg 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: 1.39 psia									
Water Pollution HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.			6. WATER POLLUTION 6.1 Aquatic Toxicity: 30-70 ppm/24 hr/creek chub/critical range/fresh water 6.2 Waterfowl Toxicity: Currently not available 6.3 Biological Oxygen Demand (BOD): 26.5% theo., 5 days 6.4 Food Chain Concentration Potential: None 6.5 GESAMP Hazard Profile: Bioaccumulation: 0 Damage to living resources: 2 Human Oral hazard: 2 Human Contact hazard: II Reduction of amenities: XXX	NOTES									
1. CORRECTIVE RESPONSE ACTIONS Dilute and disperse Stop discharge Do not burn	2. CHEMICAL DESIGNATIONS 2.1 CG Compatibility Group: 7; Aliphatic amines 2.2 Formula: CH ₃ (CH ₂) ₃ NH ₂ 2.3 IMO/UN Designation: 3.2/1125 2.4 DOT ID No.: Not listed 2.5 CAS Registry No.: 109-73-9 2.6 NAERG Guide No.: 132 2.7 Standard Industrial Trade Classification: 51489	3. HEALTH HAZARDS 3.1 Personal Protective Equipment: Air-supplied mask; rubber gloves; coverall goggles; face shield; butyl rubber apron 3.2 Symptoms Following Exposure: Inhalation causes irritation, nausea, vomiting, headache, faintness, severe coughing and chest pains; can cause lung edema. Ingestion causes severe irritation of mouth and stomach. Contact with eyes causes severe irritation and edema of the cornea. Contact with skin causes burns; absorption through skin may cause nausea, vomiting and shock. 3.3 Treatment of Exposure: INHALATION: remove victim to fresh air; call a physician; give oxygen if breathing is difficult; if not breathing, give artificial respiration. INGESTION: give large amounts of water; get medical attention. EYES: flush with water at least 15 min.; get medical care. SKIN: remove contaminated clothing; flush skin with plenty of water at least 15 min. 3.4 TLV-TWA: Not listed. 3.5 TLV-STEL: Not listed. 3.6 TLV-Ceiling: 5 ppm. 3.7 Toxicity by Ingestion: Grade 3; oral LD ₅₀ = 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: Currently not available. 3.13IDLH Value: 300 ppm 3.14 OSHA PEL-TWA: Not listed. 3.15 OSHA PEL-STEL: Not listed. 3.16 OSHA PEL-Ceiling: 5 ppm. 3.17 EPA AEGL: Not listed											

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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
30	47.450	45	0.595		N	51	0.850
35	47.280	50	0.598		T	52	0.842
40	47.120	55	0.600			53	0.835
45	46.950	60	0.602		P	54	0.827
50	46.780	65	0.604		R	55	0.820
55	46.620	70	0.606		E	56	0.813
60	46.460	75	0.608		I	57	0.805
65	46.290	80	0.610		N	58	0.798
70	46.130	85	0.612		E	59	0.791
75	45.970	90	0.614		T	60	0.784
80	45.800	95	0.616			61	0.777
85	45.640	100	0.618		N	62	0.771
90	45.480	105	0.621		T	63	0.764
95	45.320	110	0.623			64	0.757
100	45.160	115	0.625		P	65	0.751
105	45.000	120	0.627		R	66	0.744
110	44.840	125	0.629		E	67	0.738
115	44.680	130	0.631		I	68	0.732
120	44.520				N	69	0.726
125	44.360				T	70	0.719
130	44.200				P	71	0.713
135	44.040				R	72	0.707
140	43.880				E	73	0.702
145	43.730				I	74	0.696
150	43.570				N	75	0.690
					T	76	0.684

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
M	35	0.609	35	0.00838	50	0.400	
I	40	0.710	40	0.00969	100	0.427	
S	45	0.826	45	0.01115	150	0.453	
C	50	0.957	50	0.01279	200	0.479	
I	55	1.104	55	0.01462	250	0.503	
B	60	1.270	60	0.01666	300	0.527	
L	65	1.457	65	0.01892	350	0.550	
E	70	1.665	70	0.02142	400	0.573	
	75	1.898	75	0.02418	450	0.594	
	80	2.156	80	0.02722	500	0.615	
	85	2.443	85	0.03056	550	0.635	
	90	2.761	90	0.03422	600	0.655	
	95	3.111	95	0.03822	650	0.673	
	100	3.497	100	0.04258	700	0.691	
	105	3.921	105	0.04732	750	0.708	
	110	4.386	110	0.05246	800	0.725	
	115	4.895	115	0.05804	850	0.740	
	120	5.451	120	0.06407	900	0.755	
	125	6.056	125	0.07057	950	0.770	
	130	6.714	130	0.07758	1000	0.783	
	135	7.428	135	0.08511	1050	0.796	
	140	8.202	140	0.09319	1100	0.808	
	145	9.039	145	0.10190	1150	0.819	
	150	9.942	150	0.11110			
	155	10.920	155	0.12100			
	160	11.960	160	0.13150			