

1-BROMOBUTANE

BBU

CAUTIONARY RESPONSE INFORMATION

Common Synonyms		Liquid	Colorless to pale yellow
n-Bromobutane Butyl bromide n-Butyl bromide		Sinks in water.	
<p style="color: red;">Avoid contact with liquid or vapor. Keep people away. Wear self-contained breathing apparatus and full protective clothing. Shut off all sources of ignition. Call fire department. Notify local health and pollution control agencies. Protect water intakes.</p>			
Fire	FLAMMABLE Water may be ineffective against fire. Flashback along vapor trail may occur. Wear self-contained breathing apparatus and full protective clothing. Extinguish with dry chemical, CO ₂ , or foam.		
Exposure	CALL FOR MEDICAL AID. VAPOR May be harmful if inhaled or absorbed through skin. Irritating to the eyes, upper respiratory tract, nose and throat. Move victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID Irritating to eyes and skin. May be harmful if swallowed or absorbed through the skin. Remove contaminated clothing and shoes. Flush affected areas with water. Wash with soap and water. IF IN EYES: immediately flush with water for at least 15 minutes. IF SWALLOWED and victim is CONSCIOUS: have victim drink water and induce vomiting IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS: do nothing except keep victim warm.		
Water Pollution	Effects of low concentrations on aquatic life are not known. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.		

1. CORRECTIVE RESPONSE ACTIONS Stop discharge Do not burn	2. CHEMICAL DESIGNATIONS 2.1 CG Compatibility Group: Not listed. 2.2 Formula: CH ₃ CH ₂ CH ₂ CH ₂ Br 2.3 IMO/UN Designation: 3.3/1126 2.4 DOT ID No.: 1126 2.5 CAS Registry No.: 109-65-9 2.6 NAERG Guide No.: 129 2.7 Standard Industrial Trade Classification: 51139
3. HEALTH HAZARDS	
<p>3.1 Personal Protective Equipment: Approved respirator, chemical safety goggles, rubber gloves.</p> <p>3.2 Symptoms Following Exposure: Irritating to the eyes, nose, throat, and upper respiratory tract. Symptoms of exposure include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Irritating to the skin.</p> <p>3.3 Treatment of Exposure: INHALATION: Move victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. EYES OR SKIN: Flush with water for at least 15 minutes. INGESTION: If conscious, have victim drink water and induce vomiting. If unconscious, do nothing except keep victim warm. Call a physician.</p> <p>3.4 TLV-TWA: Not listed.</p> <p>3.5 TLV-STEL: Not listed.</p> <p>3.6 TLV-Ceiling: Not listed.</p> <p>3.7 Toxicity by Ingestion: Grade 2; LD₅₀ = 4.45 g/kg (rat, ipr)</p> <p>3.8 Toxicity by Inhalation: Currently not available.</p> <p>3.9 Chronic Toxicity: Currently not available</p> <p>3.10 Vapor (Gas) Irritant Characteristics: Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.</p> <p>3.11 Liquid or Solid Characteristics: Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of skin.</p> <p>3.12 Odor Threshold: Currently not available</p> <p>3.13 IDLH Value: Not listed.</p> <p>3.14 OSHA PEL-TWA: Not listed.</p> <p>3.15 OSHA PEL-STEL: Not listed.</p> <p>3.16 OSHA PEL-Ceiling: Not listed.</p> <p>3.17 EPA AEGL: Not listed</p>	

4. FIRE HAZARDS

- 4.1 Flash Point: 65°F C.C.
4.2 Flammable Limits in Air: 2.5-6.6% at 100°C
4.3 Fire Extinguishing Agents: CO₂, dry chemical, or foam.
4.4 Fire Extinguishing Agents Not to Be Used: Water may be ineffective against fire.
4.5 Special Hazards of Combustion Products: Toxic fumes of hydrogen bromide.
4.6 Behavior in Fire: May form explosive mixtures with air in fire.
4.7 Auto Ignition Temperature: 509°F
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: 28.6 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 12.0 (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: Incompatible with strong bases and 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: 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: Currently not available
6.5 GESAMP Hazard Profile:
Bioaccumulation: 0
Damage to living resources: 2
Human Oral hazard: (1)
Human Contact hazard: -
Reduction of amenities: X

7. SHIPPING INFORMATION

- 7.1 Grades of Purity: 99%
7.2 Storage Temperature: Ambient
7.3 Inert Atmosphere: Currently not available
7.4 Venting: None
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: No
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: 137.04
9.3 Boiling Point at 1 atm: 214°F = 101.4°C = 375°K
9.4 Freezing Point: -170°F = -112.4°C = 161°K
9.5 Critical Temperature: Currently not available
9.6 Critical Pressure: Currently not available
9.7 Specific Gravity: 1.276 at 20°C
9.8 Liquid Surface Tension: 26.5 dyne/cm = 0.026 N/m at 20°C
9.9 Liquid Water Interfacial Tension: Currently not available
9.10 Vapor (Gas) Specific Gravity: 4.72
9.11 Ratio of Specific Heats of Vapor (Gas): Currently not available
9.12 Latent Heat of Vaporization: Currently not available
9.13 Heat of Combustion: Currently not available
9.14 Heat of Decomposition: Currently not available
9.15 Heat of Solution: Currently not available
9.16 Heat of Polymerization: Currently not available
9.17 Heat of Fusion: Currently not available
9.18 Limiting Value: Currently not available
9.19 Reid Vapor Pressure: 1.5 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
68	79.650		C U R R E N T L Y N O T A V A I L A B L E		C U R R E N T L Y N O T A V A I L A B L E	59 60 61 62 63 64 65 66 67 68	0.626 0.627 0.628 0.629 0.629 0.630 0.631 0.632 0.632 0.633

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
60	0.060	-40 -20 0 20 40 60 80 100 120 140 160 180 200	0.036 0.058 0.095 0.155 0.254 0.415 0.678 1.108 1.811 2.960 4.839 7.909 12.928		C U R R E N T L Y N O T A V A I L A B L E	0 25 50 75 100 125 150 175 200 225 250 275 300 325 350 375 400 425 450 475 500 525 550 575 600	0.183 0.189 0.194 0.200 0.205 0.211 0.217 0.222 0.228 0.233 0.239 0.245 0.250 0.256 0.261 0.267 0.273 0.278 0.284 0.289 0.295 0.301 0.306 0.312 0.317