

N-BUTYL METHACRYLATE

BMN

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Butyl methacrylate Butyl 2-methacrylate n-Butyl alpha-methylacrylate Butyl 2-methyl-2-propenoate Methacrylic acid, butyl ester	Liquid Colorless Mild odor
	Floats on water.
<p>Keep people away. Call fire department. Avoid contact with liquid and vapor. Notify local health and pollution control agencies.</p>	
Fire	Combustible. Containers may explode in fire. Extinguish with dry chemicals, foam or carbon dioxide. Water may be ineffective on fire. Cool exposed containers with water.
Exposure	Call for medical aid. 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.
Water Pollution	Effect of low concentrations on aquatic life is unknown. Fouling to shoreline. 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
Contain
Collection Systems: Skim
Chemical and Physical Treatment: Burn;
Absorb
Clean shore line
Salvage waterfowl

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: 14; Acrylates
2.2 Formula: $\text{CH}_2=\text{C}(\text{CH}_3)\text{COOCH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
2.3 IMO/UN Designation: Not listed
2.4 DOT ID No.: 2227
2.5 CAS Registry No.: 97-88-1
2.6 NAERG Guide No.: 129P
2.7 Standard Industrial Trade Classification: 51373

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Wear self contained positive pressure breathing apparatus and full protective clothing.
- 3.2 **Symptoms Following Exposure:** Inhalation may cause nausea because of offensive odor. Contact with liquid causes irritation of eyes and mild irritation of skin. Ingestion causes irritation of mouth and stomach.
- 3.3 **Treatment of Exposure:** INHALATION: remove to fresh air; give oxygen or artificial respiration as required. EYES: flush with copious amounts of water for 15 min. and consult physician. SKIN: wash with soap and water. INGESTION: do not induce vomiting; call a physician.
- 3.4 **TLV-TWA:** Not listed.
3.5 **TLV-STEL:** Not listed.
3.6 **TLV-Ceiling:** Not listed.
3.7 **Toxicity by Ingestion:** Grade 0; LD_{50} > 15 g/kg
3.8 **Toxicity by Inhalation:** Currently not available.
3.9 **Chronic Toxicity:** Birth defects in rats (gross and skeletal abnormalities)
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:** 130°F O.C.
4.2 **Flammable Limits in Air:** (est.) 2%-8%
4.3 **Fire Extinguishing Agents:** Dry chemical, foam, carbon dioxide
4.4 **Fire Extinguishing Agents Not to Be Used:** Water may be ineffective.
4.5 **Special Hazards of Combustion Products:** Not pertinent
4.6 **Behavior in Fire:** Containers may explode due to polymerization.
4.7 **Auto Ignition Temperature:** 562°F
4.8 **Electrical Hazards:** Currently not available
4.9 **Burning Rate:** 4.8 mm/min.
4.10 **Adiabatic Flame Temperature:** Currently not available
4.11 **Stoichiometric Air to Fuel Ratio:** 50.0 (calc.)
4.12 **Flame Temperature:** Currently not available
4.13 **Combustion Molar Ratio (Reactant to Product):** 15.0 (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:** No reaction
5.3 **Stability During Transport:** Stable
5.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
5.5 **Polymerization:** May occur when heated.
5.6 **Inhibitor of Polymerization:** 9-15 ppm monomethyl ether of hydroquinone 90-120 ppm hydroquinone

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:**
Bioaccumulation: 0
Damage to living resources: 1
Human Oral hazard: 0
Human Contact hazard: I
Reduction of amenities: XX

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** 98.5+%
7.2 **Storage Temperature:** Ambient
7.3 **Inert Atmosphere:** No requirement
7.4 **Venting:** Pressure-vacuum
7.5 **IMO Pollution Category:** D
7.6 **Ship Type:** 3
7.7 **Barge Hull Type:** 3

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Flammable liquid
8.2 **49 CFR Class:** 3
8.3 **49 CFR Package Group:** III
8.4 **Marine Pollutant:** No
8.5 **NFPA Hazard Classification:**
- | Category | Classification |
|---------------------------|----------------|
| Health Hazard (Blue)..... | 2 |
| Flammability (Red)..... | 2 |
| 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:** 142.2
9.3 **Boiling Point at 1 atm:** 325°F = 163°C = 436°K
9.4 **Freezing Point:** <32°F = <0°C = <273°F
9.5 **Critical Temperature:** Not pertinent
9.6 **Critical Pressure:** Not pertinent
9.7 **Specific Gravity:** 0.8975 at 20°C (liquid)
9.8 **Liquid Surface Tension:** (est.) 30 dynes/cm = 0.030 N/m at 20°C
9.9 **Liquid Water Interfacial Tension:** (est.) 35 dynes/cm = 0.035 N/m at 20°C
9.10 **Vapor (Gas) Specific Gravity:** Not pertinent
9.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
9.12 **Latent Heat of Vaporization:** Not pertinent
9.13 **Heat of Combustion:** (est.) -14,800 Btu/lb = -8,230 cal/g = -344 X 10⁵ J/kg
9.14 **Heat of Decomposition:** Not pertinent
9.15 **Heat of Solution:** Not pertinent
9.16 **Heat of Polymerization:** -180 Btu/lb = -100 cal/g = -4.2 X 10⁵ J/kg
9.17 **Heat of Fusion:** Currently not available
9.18 **Limiting Value:** Currently not available
9.19 **Reid Vapor Pressure:** Low

NOTES

N-BUTYL METHACRYLATE

BMN

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
54	56.410	60	0.460	60	1.048	60	3.575
56	56.340	61	0.460	61	1.048	61	3.525
58	56.270	62	0.460	62	1.048	62	3.476
60	56.200	63	0.460	63	1.048	63	3.428
62	56.140	64	0.460	64	1.048	64	3.381
64	56.070	65	0.460	65	1.048	65	3.335
66	56.000	66	0.460	66	1.048	66	3.290
68	55.930	67	0.460	67	1.048	67	3.245
70	55.860	68	0.460	68	1.048	68	3.201
72	55.790	69	0.460	69	1.048	69	3.158
74	55.720	70	0.460	70	1.048	70	3.116
76	55.650	71	0.460	71	1.048	71	3.074
78	55.590	72	0.460	72	1.048	72	3.033
80	55.520	73	0.460	73	1.048	73	2.993
82	55.450	74	0.460	74	1.048	74	2.954
84	55.380	75	0.460	75	1.048	75	2.915
86	55.310	76	0.460	76	1.048	76	2.877
88	55.240	77	0.460	77	1.048	77	2.839
90	55.170						
92	55.110						
94	55.040						
96	54.970						
98	54.900						

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	70	0.081	70	0.00203		N
	N	80	0.109	80	0.00268		O
	S	90	0.145	90	0.00350		T
	O	100	0.191	100	0.00453		
	L	110	0.250	110	0.00581		P
	U	120	0.323	120	0.00737		E
	B	130	0.413	130	0.00928		R
	L	140	0.525	140	0.01160		T
	E	150	0.662	150	0.01438		I
		160	0.828	160	0.01770		N
		170	1.028	170	0.02163		E
		180	1.269	180	0.02627		N
		190	1.555	190	0.03171		T
		200	1.895	200	0.03805		
		210	2.295	210	0.04540		
		220	2.764	220	0.05387		
		230	3.311	230	0.06359		
		240	3.945	240	0.07469		
		250	4.678	250	0.08732		
		260	5.521	260	0.10160		
		270	6.486	270	0.11780		
		280	7.587	280	0.13590		
		290	8.838	290	0.15620		
		300	10.250	300	0.17880		
		310	11.850	310	0.20400		
		320	13.640	320	0.23180		