

ISOBUTYL ALCOHOL

IAL

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Fermentation butyl alcohol Isobutanol Isopropylcarbinol 2-Methyl-1-propanol		Oily liquid	Colorless	Mild alcohol, choking odor
Floats and mixes slowly with water. Irritating vapor is produced.				
<p>Keep people away. Avoid contact with liquid and vapor. Shut off ignition sources and call fire department. Stay upwind and use water spray to "knock down" vapor. Notify local health and pollution control agencies.</p>				
Fire	<p>FLAMMABLE. Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Extinguish with dry chemical, 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 Irritating to eyes, nose and throat. If inhaled, will cause nausea, dizziness, or headache. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.</p> <p>LIQUID Irritating to eyes. Harmful if swallowed. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.</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

Dilute and disperse
Stop discharge
Contain
Collection Systems: Skim
Salvage waterfowl

2. CHEMICAL DESIGNATIONS

2.1 **CG Compatibility Group:** 20; Alcohol, glycol
2.2 **Formula:** (CH₃)CHCH₂OH
2.3 **IMO/UN Designation:** 3.3/1212
2.4 **DOT ID No.:** 1212
2.5 **CAS Registry No.:** 78-83-1
2.6 **NAERG Guide No.:** 129
2.7 **Standard Industrial Trade Classification:** 51213

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Air pack or organic canister; chemical goggles.
3.2 **Symptoms Following Exposure:** Contact with eyes is extremely irritating and may cause burns. Breathing vapors will be irritating to the nose and throat. In high concentrations, may cause nausea, dizziness, headache, and stupor.
3.3 **Treatment of Exposure:** INHALATION: if victim is overcome by vapors, remove him from exposure immediately; call a physician; if breathing is irregular or has stopped, start resuscitation; administer oxygen. EYES: flush with water for at least 15 min.
3.4 **TLV-TWA:** 50 ppm
3.5 **TLV-STEL:** Not listed.
3.6 **TLV-Ceiling:** Not listed.
3.7 **Toxicity by Ingestion:** Grade 2; LD₅₀ = 0.5 to 5 g/kg (rat)
3.8 **Toxicity by Inhalation:** Currently not available.
3.9 **Chronic Toxicity:** Currently not available
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.
3.11 **Liquid or Solid Characteristics:** No appreciable hazard. Practically harmless to the skin.
3.12 **Odor Threshold:** Currently not available
3.13 **IDLH Value:** 1,600 ppm
3.14 **OSHA PEL-TWA:** 100 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:** 90°F O.C. 82°F C.C.
4.2 **Flammable Limits in Air:** 1.6%-10.9%
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:** Not pertinent
4.6 **Behavior in Fire:** Not pertinent
4.7 **Auto Ignition Temperature:** 800°F
4.8 **Electrical Hazards:** Class I, group D
4.9 **Burning Rate:** 3.5 mm/min.
4.10 **Adiabatic Flame Temperature:** Currently not available
4.11 **Stoichiometric Air to Fuel Ratio:** 20.2 (calc.)
4.12 **Flame Temperature:** Currently not available
4.13 **Combustion Molar Ratio (Reactant to Product):** 6.5 (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:** Not pertinent
5.6 **Inhibitor of Polymerization:** Not pertinent

6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:** 4680 ppm/1 hr/fish/lethal/fresh water
6.2 **Waterfowl Toxicity:** Currently not available
6.3 **Biological Oxygen Demand (BOD):** 162%, 5 days
6.4 **Food Chain Concentration Potential:** None
6.5 **GESAMP Hazard Profile:**
Bioaccumulation: 0
Damage to living resources: 0
Human Oral hazard: 1
Human Contact hazard: 1
Reduction of amenities: X

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** 99+%
7.2 **Storage Temperature:** Ambient
7.3 **Inert Atmosphere:** No requirement
7.4 **Venting:** Open (flame arrester)
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:** III
8.4 **Marine Pollutant:** No
8.5 **NFPA Hazard Classification:**
- | | |
|---------------------------|----------------|
| Category | Classification |
| Health Hazard (Blue)..... | 1 |
| Flammability (Red)..... | 3 |
| Instability (Yellow)..... | 0 |
- 8.6 **EPA Reportable Quantity:** 5000 pounds
8.7 **EPA Pollution Category:** D
8.8 **RCRA Waste Number:** U140
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:** 74.12
9.3 **Boiling Point at 1 atm:** 226.2°F = 107.9°C = 381.1°K
9.4 **Freezing Point:** -162°F = -108°C = 165°K
9.5 **Critical Temperature:** 526.3°F = 274.6°C = 547.8°K
9.6 **Critical Pressure:** 623 psia = 42.4 atm = 4.30 MN/m²
9.7 **Specific Gravity:** 0.802 at 20°C (liquid)
9.8 **Liquid Surface Tension:** Not pertinent
9.9 **Liquid Water Interfacial Tension:** Not pertinent
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:** 248 Btu/lb = 138 cal/g = 5.78 X 10⁵ J/kg
9.13 **Heat of Combustion:** -14,220 Btu/lb = -7,900 cal/g = -330.8 X 10⁵ J/kg
9.14 **Heat of Decomposition:** Not pertinent
9.15 **Heat of Solution:** (est.) -9 Btu/lb = -5 cal/g = -0.2 X 10⁵ 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:** 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
35	50.920	-50	0.461	45	0.930		
40	50.790	-40	0.469	50	0.927		N
45	50.660	-30	0.477	55	0.924		O
50	50.530	-20	0.484	60	0.920		T
55	50.400	-10	0.492	65	0.917		
60	50.270	0	0.500	70	0.914		P
65	50.140	10	0.508	75	0.911		E
70	50.010	20	0.516	80	0.908		R
75	49.880	30	0.523	85	0.904		T
80	49.750	40	0.531	90	0.901		I
85	49.620	50	0.539	95	0.898		N
90	49.490	60	0.547	100	0.895		E
95	49.360	70	0.554	105	0.892		N
100	49.230	80	0.562	110	0.888		T
105	49.100	90	0.570	115	0.885		
110	48.970	100	0.578	120	0.882		
115	48.840	110	0.586	125	0.879		
120	48.710	120	0.593	130	0.876		
		130	0.601				
		140	0.609				

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
68	8.500	55	0.091	55	0.00122	0	0.352
		60	0.112	60	0.00149	25	0.365
		65	0.137	65	0.00181	50	0.379
		70	0.167	70	0.00218	75	0.392
		75	0.204	75	0.00263	100	0.404
		80	0.247	80	0.00316	125	0.417
		85	0.298	85	0.00377	150	0.429
		90	0.358	90	0.00450	175	0.441
		95	0.429	95	0.00534	200	0.453
		100	0.513	100	0.00633	225	0.465
		105	0.611	105	0.00747	250	0.476
		110	0.726	110	0.00880	275	0.487
		115	0.860	115	0.01033	300	0.498
		120	1.015	120	0.01209	325	0.509
		125	1.195	125	0.01411	350	0.520
		130	1.403	130	0.01643	375	0.530
		135	1.642	135	0.01907	400	0.540
		140	1.918	140	0.02209	425	0.550
		145	2.234	145	0.02551	450	0.560
		150	2.596	150	0.02940	475	0.570
		155	3.009	155	0.03380	500	0.579
						525	0.588
						550	0.597
						575	0.606
						600	0.615