

ISOBUTYLENE

IBL

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Isobutene 2-Methylpropene		Liquefied compressed gas Colorless Sweet gasoline-like odor
Floats and boils on water. Flammable visible vapor cloud is produced.		
<p>Evacuate. Keep people away. Shut off ignition sources and call fire department. Stay upwind and use water spray to "knock down" vapor. Avoid contact with liquid. 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. Stop flow of gas if possible. Cool exposed containers and protect men effecting shutoff with water. Let fire burn. Extinguish small fires with water, dry chemical, or carbon dioxide.</p>	
Exposure	<p>CALL FOR MEDICAL AID.</p> <p>VAPOR Irritating to eyes, nose, and throat. If inhaled, will cause dizziness, or loss of consciousness. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.</p> <p>LIQUID Will cause frostbite. Flush affected areas with plenty of water. DO NOT RUB AFFECTED AREAS.</p>	
Water Pollution	Not harmful to aquatic life.	

<p>1. CORRECTIVE RESPONSE ACTIONS Stop discharge Chemical and Physical Treatment: Burn</p>	<p>2. CHEMICAL DESIGNATIONS 2.1 CG Compatibility Group: 30; Olefin 2.2 Formula: (CH₂)₂C = CH₂ 2.3 IMO/UN Designation: 2/1055 2.4 DOT ID No.: 1055 2.5 CAS Registry No.: 115-11-7 2.6 NAERG Guide No.: 115 2.7 Standard Industrial Trade Classification: 51113</p>
<p>3. HEALTH HAZARDS</p> <p>3.1 Personal Protective Equipment: Chemical gloves and eye protection; organic vapor canister or self-contained breathing apparatus.</p> <p>3.2 Symptoms Following Exposure: Inhalation of moderate concentrations causes dizziness, drowsiness, and unconsciousness. Contact with eyes or skin may cause irritation; the liquid may cause frostbite.</p> <p>3.3 Treatment of Exposure: INHALATION: remove victim to fresh air and apply resuscitation; call a physician promptly if victim is unconscious. EYES: if irritated, wash with water. SKIN: if irritated, wash with soap and water.</p> <p>3.4 TLV-TWA: Not listed. 3.5 TLV-STEL: Not listed. 3.6 TLV-Ceiling: Not listed. 3.7 Toxicity by Ingestion: Not pertinent 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: None 3.10 Vapor (Gas) Irritant Characteristics: Vapors are non-irritating to eyes and throat. 3.11 Liquid or Solid Characteristics: No appreciable hazard. Practically harmless to skin because it is very volatile and evaporate quickly. May cause frostbite. 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</p>	

4. FIRE HAZARDS

- 4.1 **Flash Point:**
Gas
- 4.2 **Flammable Limits in Air:** 1.8%-9.6%
- 4.3 **Fire Extinguishing Agents:** Let fire burn, stop flow of gas. Water fog, dry chemical, or carbon dioxide may be used for small fires.
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Not pertinent
- 4.5 **Special Hazards of Combustion Products:** Not pertinent
- 4.6 **Behavior in Fire:** Containers may explode in fire. Vapor is heavier than air and may travel a long distance to a source of ignition and flash back.
- 4.7 **Auto Ignition Temperature:** 869°F
- 4.8 **Electrical Hazards:** Not pertinent
- 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):** 8.0 (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:** Not pertinent
- 5.6 **Inhibitor of Polymerization:** Not pertinent

6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:**
None
- 6.2 **Waterfowl Toxicity:** None
- 6.3 **Biological Oxygen Demand (BOD):** None
- 6.4 **Food Chain Concentration Potential:** None
- 6.5 **GESAMP Hazard Profile:** Not listed

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Commercial
- 7.2 **Storage Temperature:** Ambient
- 7.3 **Inert Atmosphere:** No requirement
- 7.4 **Venting:** Safety relief
- 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 gas
- 8.2 **49 CFR Class:** 2.1
- 8.3 **49 CFR Package Group:** Not pertinent.
- 8.4 **Marine Pollutant:** No
- 8.5 **NFPA Hazard Classification:**
- | Category | Classification |
|---------------------------|----------------|
| Health Hazard (Blue)..... | 1 |
| Flammability (Red)..... | 4 |
| 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:** Gas
- 9.2 **Molecular Weight:** 56.10
- 9.3 **Boiling Point at 1 atm:** 19.6°F = -6.9°C = 266.3°K
- 9.4 **Freezing Point:** -220°F = -140.3°C = 132.9°K
- 9.5 **Critical Temperature:** 292.5°F = -144.7°C = 417.9°K
- 9.6 **Critical Pressure:** 580 psia = 39.48 atm = 3.99 MN/m²
- 9.7 **Specific Gravity:** 0.59 at 20°C (liquid)
- 9.8 **Liquid Surface Tension:** 15.8 dynes/cm = 0.0158 N/m at 20°C
- 9.9 **Liquid Water Interfacial Tension:** (est.) 40 dynes/cm = 0.04 N/m at -10°C
- 9.10 **Vapor (Gas) Specific Gravity:** 1.9
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.061
- 9.12 **Latent Heat of Vaporization:** 170 Btu/lb = 94.3 cal/g = 3.95 X 10⁵ J/kg
- 9.13 **Heat of Combustion:** -19,359 Btu/lb = -10,755 cal/g = -450.29 X 10³ 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:** 25.25 cal/g
- 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
N O T P E R T I N E N T		-20	0.498	-115	1.175	-20	0.195
		-15	0.501	-110	1.160	-10	0.190
		-10	0.504	-105	1.145	0	0.184
		-5	0.507	-100	1.130	10	0.179
		0	0.510	-95	1.115		
		5	0.513	-90	1.100		
		10	0.516	-85	1.085		
		15	0.520	-80	1.070		
				-75	1.054		
				-70	1.039		
				-65	1.024		
				-60	1.009		
				-55	0.994		
				-50	0.979		
				-45	0.964		
				-40	0.949		
				-35	0.934		
			-30	0.919			
			-25	0.904			
			-20	0.889			
			-15	0.874			
			-10	0.859			
			-5	0.844			
			0	0.829			
			5	0.814			

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 N S O L U B I L I T Y		-55	2.182	-55	0.02818	0	0.597
		-50	2.534	-50	0.03233	25	0.606
		-45	2.933	-45	0.03696	50	0.614
		-40	3.382	-40	0.04212	75	0.623
		-35	3.887	-35	0.04783	100	0.632
		-30	4.453	-30	0.05416	125	0.640
		-25	5.085	-25	0.06114	150	0.649
		-20	5.789	-20	0.06882	175	0.657
		-15	6.572	-15	0.07724	200	0.665
		-10	7.440	-10	0.08647	225	0.673
		-5	8.400	-5	0.09655	250	0.681
		0	9.458	0	0.10750	275	0.689
		5	10.620	5	0.11950	300	0.697
		10	11.900	10	0.13240	325	0.705
		15	13.300	15	0.14640	350	0.713
		20	14.830	20	0.16160	375	0.720
		25	16.500	25	0.17790	400	0.728
		30	18.320	30	0.19550	425	0.735
		35	20.290	35	0.21440	450	0.743
		40	22.430	40	0.23460	475	0.750
		45	24.750	45	0.25630	500	0.757
	50	27.260	50	0.27950	525	0.764	
	55	29.960	55	0.30420	550	0.771	
	60	32.870	60	0.33060	575	0.778	
	65	36.000	65	0.35860	600	0.785	
	70	39.360	70	0.38840			