

# 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.	
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.		
Fire	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.	
Exposure	CALL FOR MEDICAL AID.  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.  LIQUID Will cause frostbite. Flush affected areas with plenty of water. DO NOT RUB AFFECTED AREAS.	
Water Pollution	Not harmful to aquatic life.	

1. CORRECTIVE RESPONSE ACTIONS	2. CHEMICAL DESIGNATIONS
Stop discharge Chemical and Physical Treatment: Burn	2.1 CG Compatibility Group: 30; Olefin 2.2 Formula: $(\text{CH}_2)_2\text{C} = \text{CH}_2$ 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
<b>3. HEALTH HAZARDS</b>	
<p><b>3.1 Personal Protective Equipment:</b> Chemical gloves and eye protection; organic vapor canister or self-contained breathing apparatus.</p> <p><b>3.2 Symptoms Following Exposure:</b> Inhalation of moderate concentrations causes dizziness, drowsiness, and unconsciousness. Contact with eyes or skin may cause irritation; the liquid may cause frostbite.</p> <p><b>3.3 Treatment of Exposure:</b> 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><b>3.4 TLV-TWA:</b> Not listed.</p> <p><b>3.5 TLV-STEL:</b> Not listed.</p> <p><b>3.6 TLV-Ceiling:</b> Not listed.</p> <p><b>3.7 Toxicity by Ingestion:</b> Not pertinent</p> <p><b>3.8 Toxicity by Inhalation:</b> Currently not available.</p> <p><b>3.9 Chronic Toxicity:</b> None</p> <p><b>3.10 Vapor (Gas) Irritant Characteristics:</b> Vapors are non-irritating to eyes and throat.</p> <p><b>3.11 Liquid or Solid Characteristics:</b> No appreciable hazard. Practically harmless to skin because it is very volatile and evaporate quickly. May cause frostbite.</p> <p><b>3.12 Odor Threshold:</b> Currently not available</p> <p><b>3.13 IDLH Value:</b> Not listed</p> <p><b>3.14 OSHA PEL-TWA:</b> Not listed.</p> <p><b>3.15 OSHA PEL-STEL:</b> Not listed.</p> <p><b>3.16 OSHA PEL-Ceiling:</b> Not listed.</p> <p><b>3.17 EPA AEGL:</b> Not listed</p>	

4. FIRE HAZARDS	7. SHIPPING INFORMATION
4.1 Flash Point: Gas	7.1 Grades of Purity: Commercial
4.2 Flammable Limits in Air: 1.8%-9.6%	7.2 Storage Temperature: Ambient
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.	7.3 Inert Atmosphere: No requirement
4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent	7.4 Venting: Safety relief
4.5 Special Hazards of Combustion Products: Not pertinent	7.5 IMO Pollution Category: Currently not available
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.	7.6 Ship Type: Currently not available
4.7 Auto Ignition Temperature: 869°F	7.7 Barge Hull Type: Currently not available
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	
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 FWCNA 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 10⁵ 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 -15 -10 -5 0 5 10 15	-20 -15 -10 -5 0 5 10 15	0.498 0.501 0.504 0.507 0.510 0.513 0.516 0.520	-115 -110 -105 -100 -95 -90 -85 -80 -75 -70 -65 -60 -55 -50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5	1.175 1.160 1.145 1.130 1.115 1.100 1.085 1.070 1.054 1.039 1.024 1.009 0.994 0.979 0.964 0.949 0.934 0.919 0.904 0.889 0.874 0.859 0.844 0.829 0.814	-20 -10 0 10	0.195 0.190 0.184 0.179

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