

# ISOBUTYLAMINE

IAM

CAUTIONARY RESPONSE INFORMATION			
Common Synonyms 1-Amino-2-methylpropane iso-Butylamine Monoisobutylamine	Liquid	Colorless	Strong ammonia odor  Floats and mixes with water.
Evacuate. Keep people away. Shut off ignition sources. Call fire department. Avoid contact with liquid and vapor. Notify local health and pollution control agencies.			
Fire	FLAMMABLE POISONOUS GASES MAY BE PRODUCED IN FIRE. Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Wear goggles and self-contained breathing apparatus. Extinguish with dry chemicals, alcohol foam, or carbon dioxide. Cool exposed containers with water.		
Exposure	CALL FOR MEDICAL AID.  IRRITANT Irritating to eyes, nose and throat. If inhaled will cause coughing, difficult breathing or loss of consciousness. If in eyes, hold eyelids open and flush with plenty of water. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.  LIQUID Will burn skin and eyes. If swallowed will cause nausea or loss of consciousness. 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.		
Water Pollution	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.		

1. CORRECTIVE RESPONSE ACTIONS	2. CHEMICAL DESIGNATIONS	3. HEALTH HAZARDS
Dilute and disperse Stop discharge	<b>2.1 CG Compatibility Group:</b> 7; Aliphatic amine <b>2.2 Formula:</b> $(\text{CH}_3)_2\text{CHCH}_2\text{NH}_2$ <b>2.3 IMO/UN Designation:</b> 3.2/1214 <b>2.4 DOT ID No.:</b> 1214 <b>2.5 CAS Registry No.:</b> 78-81-9 <b>2.6 NAERG Guide No.:</b> 132 <b>2.7 Standard Industrial Trade Classification:</b> 51451	<b>3.1 Personal Protective Equipment:</b> Self-contained breathing apparatus; butyl rubber gloves; chemical face shield; butyl rubber apron <b>3.2 Symptoms Following Exposure:</b> Inhalation causes severe coughing and chest pain due to irritation of air passages; can cause lung edema. Compound is sympathomimetic and is also a cardiac depressant and convulsant; ingestion causes nausea and profuse salivation. Contact with eyes causes severe irritation and edema of the cornea. Contact with skin causes severe irritation. <b>3.3 Treatment of Exposure:</b> INHALATION: remove victim to fresh air; if not breathing, give artificial respiration; if breathing is difficult, give oxygen; call a physician. INGESTION: give large amount of water followed by dilute vinegar or lemon juice; keep patient warm. EYES: flush with water for 15 min. SKIN: flush with water. <b>3.4 TLV-TWA:</b> Not listed. <b>3.5 TLV-STEL:</b> Not listed. <b>3.6 TLV-Ceiling:</b> Not listed. <b>3.7 Toxicity by Ingestion:</b> Grade 3; oral $\text{LD}_{50} = 120 \text{ mg/kg}$ (rabbit), $250 \text{ mg/kg}$ (rat) <b>3.8 Toxicity by Inhalation:</b> Currently not available. <b>3.9 Chronic Toxicity:</b> Currently not available <b>3.10 Vapor (Gas) Irritant Characteristics:</b> Vapors are moderately irritating such that personnel will not usually tolerate moderate or high concentrations. <b>3.11 Liquid or Solid Characteristics:</b> Severe skin irritant. Causes second- and third-degree burns on short contact and is very injurious to the eyes. <b>3.12 Odor Threshold:</b> Currently not available <b>3.13 IDLH Value:</b> Not listed. <b>3.14 OSHA PEL-TWA:</b> Not listed. <b>3.15 OSHA PEL-STEL:</b> Not listed. <b>3.16 OSHA PEL-Ceiling:</b> Not listed. <b>3.17 EPA AEGL:</b> Not listed

4. FIRE HAZARDS	7. SHIPPING INFORMATION								
<b>4.1 Flash Point:</b> $15^\circ \text{C}$ . <b>4.2 Flammable Limits in Air:</b> 3.4%-9% <b>4.3 Fire Extinguishing Agents:</b> Dry chemical, "alcohol" foam, carbon dioxide <b>4.4 Fire Extinguishing Agents Not to Be Used:</b> Water may be ineffective. <b>4.5 Special Hazards of Combustion Products:</b> Toxic oxides of nitrogen may be formed in fire. <b>4.6 Behavior in Fire:</b> Vapor is heavier than air and may travel to a source of ignition and flash back. Containers may explode. <b>4.7 Auto Ignition Temperature:</b> $712^\circ \text{F}$ <b>4.8 Electrical Hazards:</b> Currently not available <b>4.9 Burning Rate:</b> 6.03 mm/min. <b>4.10 Adiabatic Flame Temperature:</b> Currently not available <b>4.11 Stoichiometric Air to Fuel Ratio:</b> 36.9 (calc.) <b>4.12 Flame Temperature:</b> Currently not available <b>4.13 Combustion Molar Ratio (Reactant to Product):</b> 10.5 (calc.) <b>4.14 Minimum Oxygen Concentration for Combustion (MOCC):</b> Not listed	<b>7.1 Grades of Purity:</b> Technical; 99+%								
	<b>7.2 Storage Temperature:</b> Ambient <b>7.3 Inert Atmosphere:</b> No requirement <b>7.4 Venting:</b> Open (flame arrester) <b>7.5 IMO Pollution Category:</b> C <b>7.6 Ship Type:</b> 2 <b>7.7 Barge Hull Type:</b> 2								
<b>8. HAZARD CLASSIFICATIONS</b>									
	<b>8.1 49 CFR Category:</b> Flammable liquid <b>8.2 49 CFR Class:</b> 3 <b>8.3 49 CFR Package Group:</b> II <b>8.4 Marine Pollutant:</b> No <b>8.5 NFPA Hazard Classification:</b> <table border="0" style="width: 100%;"> <tr> <td style="text-align: right; vertical-align: bottom;">Category</td> <td style="text-align: right; vertical-align: bottom;">Classification</td> </tr> <tr> <td style="text-align: right; vertical-align: bottom;">Health Hazard (Blue).....</td> <td style="text-align: right; vertical-align: bottom;">2</td> </tr> <tr> <td style="text-align: right; vertical-align: bottom;">Flammability (Red).....</td> <td style="text-align: right; vertical-align: bottom;">3</td> </tr> <tr> <td style="text-align: right; vertical-align: bottom;">Instability (Yellow).....</td> <td style="text-align: right; vertical-align: bottom;">0</td> </tr> </table>	Category	Classification	Health Hazard (Blue).....	2	Flammability (Red).....	3	Instability (Yellow).....	0
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Health Hazard (Blue).....	2								
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	<b>8.6 EPA Reportable Quantity:</b> Not listed. <b>8.7 EPA Pollution Category:</b> Not listed. <b>8.8 RCRA Waste Number:</b> Not listed <b>8.9 EPA FWCRA List:</b> Not listed								
5. CHEMICAL REACTIVITY	9. PHYSICAL & CHEMICAL PROPERTIES								
<b>5.1 Reactivity with Water:</b> No reaction <b>5.2 Reactivity with Common Materials:</b> Currently not available <b>5.3 Stability During Transport:</b> Stable <b>5.4 Neutralizing Agents for Acids and Caustics:</b> Not pertinent <b>5.5 Polymerization:</b> Not pertinent <b>5.6 Inhibitor of Polymerization:</b> Not pertinent	<b>9.1 Physical State at <math>15^\circ \text{C}</math> and 1 atm:</b> Liquid <b>9.2 Molecular Weight:</b> 73.1 <b>9.3 Boiling Point at 1 atm:</b> $153.3^\circ \text{F} = 67.4^\circ \text{C} = 340.6^\circ \text{K}$ <b>9.4 Freezing Point:</b> $-121.9^\circ \text{F} = -85.5^\circ \text{C} = 187.7^\circ \text{K}$ <b>9.5 Critical Temperature:</b> $469.4^\circ \text{F} = 243.0^\circ \text{C} = 516.2^\circ \text{K}$ <b>9.6 Critical Pressure:</b> 620 psia = 42 atm = $4.3 \text{ MN/m}^2$ <b>9.7 Specific Gravity:</b> 0.739 at $20^\circ \text{C}$ (liquid) <b>9.8 Liquid Surface Tension:</b> 23.70 dynes/cm = 0.0237 N/m at $20^\circ \text{C}$ <b>9.9 Liquid Water Interfacial Tension:</b> Not pertinent <b>9.10 Vapor (Gas) Specific Gravity:</b> 2.5 <b>9.11 Ratio of Specific Heats of Vapor (Gas):</b> 1.073 at $20^\circ \text{C}$ <b>9.12 Latent Heat of Vaporization:</b> $182 \text{ Btu/lb} = 101 \text{ cal/g} = 4.23 \times 10^3 \text{ J/kg}$ <b>9.13 Heat of Combustion:</b> $-17,550 \text{ Btu/lb} = -9,760 \text{ cal/g} = -408 \times 10^3 \text{ J/kg}$ <b>9.14 Heat of Decomposition:</b> Not pertinent <b>9.15 Heat of Solution:</b> $-148 \text{ Btu/lb} = -82 \text{ cal/g} = 3.4 \times 10^5 \text{ J/kg}$ <b>9.16 Heat of Polymerization:</b> Not pertinent <b>9.17 Heat of Fusion:</b> Currently not available <b>9.18 Limiting Value:</b> Currently not available <b>9.19 Reid Vapor Pressure:</b> 2.4 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
34	47.310	68	0.633		N	77	0.550
36	47.240	69	0.633		O		
38	47.170	70	0.633		T		
40	47.100	71	0.633		P		
42	47.030	72	0.633		E		
44	46.960	73	0.633		R		
46	46.890	74	0.633		T		
48	46.820	75	0.633		I		
50	46.750	76	0.633		N		
52	46.680	77	0.633		E		
54	46.620	78	0.633		N		
56	46.550	79	0.633		E		
58	46.480	80	0.633		N		
60	46.410	81	0.633		T		
62	46.340	82	0.633				
64	46.270	83	0.633				
66	46.200	84	0.633				
68	46.130	85	0.633				
70	46.060						
72	45.990						
74	45.920						
76	45.850						
78	45.780						
80	45.710						
82	45.640						
84	45.580						

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
M	0	0	0.252	0	0.00373	0	0.357
I	10	10	0.364	10	0.00528	25	0.372
S	20	20	0.516	20	0.00733	50	0.387
C	30	30	0.719	30	0.01000	75	0.402
I	40	40	0.984	40	0.01342	100	0.417
B	50	50	1.327	50	0.01773	125	0.431
L	60	60	1.764	60	0.02312	150	0.445
E	70	70	2.314	70	0.02975	175	0.459
	80	80	2.998	80	0.03783	200	0.473
	90	90	3.840	90	0.04757	225	0.486
	100	100	4.865	100	0.05919	250	0.499
	110	110	6.101	110	0.07293	275	0.512
	120	120	7.580	120	0.08905	300	0.525
	130	130	9.334	130	0.10780	325	0.537
	140	140	11.400	140	0.12940	350	0.549
	150	150	13.810	150	0.15430	375	0.561
	160	160	16.610	160	0.18250	400	0.573
	170	170	19.840	170	0.21450	425	0.585
	180	180	23.540	180	0.25060	450	0.596
	190	190	27.750	190	0.29090	475	0.607
	200	200	32.530	200	0.33580	500	0.618
						525	0.629
						550	0.639
						575	0.650
						600	0.660