

ISOBUTYRIC ACID

IBR

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Dimethylacetic acid Isopropylformic acid 2-Methylpropionic acid alpha-Methylpropionic acid Propane-2-carboxylic acid		Liquid	Colorless	Unpleasant, acrid odor
		Floats and mixes with water.		
<p>Keep people away. Avoid contact with liquid and vapor. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Call fire department. Notify local health and pollution control agencies.</p>				
Fire	Combustible. Extinguish with dry chemicals, alcohol foam, or carbon dioxide. Cool exposed containers with water.			
Exposure	CALL FOR MEDICAL AID. VAPOR Irritating to eyes, nose and throat. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID Will burn 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. DO NOT 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 pollution control officials. Notify operators of nearby water intakes.			

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge

2. CHEMICAL DESIGNATIONS

- 2.1 CG Compatibility Group: 4; Organic acid
- 2.2 Formula: (CH₃)₂CHCOOH
- 2.3 IMO/UN Designation: Not listed
- 2.4 DOT ID No.: 2529
- 2.5 CAS Registry No.: 79-31-2
- 2.6 NAERG Guide No.: 132
- 2.7 Standard Industrial Trade Classification: 51377

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Organic chemical respirator; goggles or face shield; rubber gloves
- 3.2 **Symptoms Following Exposure:** Inhalation causes irritation of nose and throat. Ingestion causes irritation of mouth and stomach. Contact with eyes or skin causes irritation.
- 3.3 **Treatment of Exposure:** INHALATION: move to fresh air. INGESTION: give large amounts of water. EYES: flush with water for at least 15 min.; get medical attention if irritation persists. SKIN: flush with water.
- 3.4 **TLV-TWA:** Not listed.
- 3.5 **TLV-STEL:** Not listed.
- 3.6 **TLV-Ceiling:** Not listed.
- 3.7 **Toxicity by Ingestion:** Grade 3; oral LD₅₀ = 280 mg/kg (rat)
- 3.8 **Toxicity by Inhalation:** Currently not available.
- 3.9 **Chronic Toxicity:** Currently not available
- 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:** 170°F O.C.
- 4.2 **Flammable Limits in Air:** Currently not available
- 4.3 **Fire Extinguishing Agents:** Dry chemical, alcohol foam, carbon dioxide
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Water may be ineffective.
- 4.5 **Special Hazards of Combustion Products:** Currently not available
- 4.6 **Behavior in Fire:** Currently not available
- 4.7 **Auto Ignition Temperature:** 935°F
- 4.8 **Electrical Hazards:** Currently not available
- 4.9 **Burning Rate:** 2.6 mm/min.
- 4.10 **Adiabatic Flame Temperature:** Currently not available
- 4.11 **Stoichiometric Air to Fuel Ratio:** 23.8 (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:** Corrosive to aluminum and other metals. Flammable hydrogen gas may accumulate in enclosed spaces.
- 5.3 **Stability During Transport:** Stable
- 5.4 **Neutralizing Agents for Acids and Caustics:** Flush with water
- 5.5 **Polymerization:** Not pertinent
- 5.6 **Inhibitor of Polymerization:** Not pertinent

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: 2
 Human Contact hazard: II
 Reduction of amenities: XX

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** 99+%
- 7.2 **Storage Temperature:** Ambient
- 7.3 **Inert Atmosphere:** No requirement
- 7.4 **Venting:** Open
- 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:** Not listed
- 8.6 **EPA Reportable Quantity:** 5000 pounds
- 8.7 **EPA Pollution Category:** D
- 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:** 88
- 9.3 **Boiling Point at 1 atm:** 309°F = 154°C = 427°K
- 9.4 **Freezing Point:** -51°F = -46°C = 227°K
- 9.5 **Critical Temperature:** 636.8°F = 336°C = 609.2°K
- 9.6 **Critical Pressure:** 588 psia = 40 atm = 4.06 MN/m²
- 9.7 **Specific Gravity:** 0.949 at 20°C (liquid)
- 9.8 **Liquid Surface Tension:** 25.1 dynes/cm = 0.0251 N/m at 20°C
- 9.9 **Liquid Water Interfacial Tension:** Not pertinent
- 9.10 **Vapor (Gas) Specific Gravity:** 3.0
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
- 9.12 **Latent Heat of Vaporization:** 202 Btu/lb = 112 cal/g = 4.68 X 10⁵ J/kg
- 9.13 **Heat of Combustion:** -10,600 Btu/lb = -5,880 cal/g = -246 X 10⁵ J/kg
- 9.14 **Heat of Decomposition:** Not pertinent
- 9.15 **Heat of Solution:** -20.5 Btu/lb = -11.4 cal/g = -0.477 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
-45	63.190	52	0.450	42	0.984	35	1.825
-40	63.000	54	0.450	44	0.984	40	1.735
-35	62.820	56	0.450	46	0.984	45	1.651
-30	62.630	58	0.450	48	0.984	50	1.572
-25	62.450	60	0.450	50	0.984	55	1.499
-20	62.270	62	0.450	52	0.984	60	1.430
-15	62.090	64	0.450	54	0.984	65	1.366
-10	61.910	66	0.450	56	0.984	70	1.306
-5	61.730	68	0.450	58	0.984	75	1.249
0	61.550	70	0.450	60	0.984	80	1.196
5	61.370	72	0.450	62	0.984	85	1.146
10	61.200	74	0.450	64	0.984	90	1.099
15	61.020	76	0.450	66	0.984	95	1.055
20	60.850	78	0.450	68	0.984	100	1.013
25	60.680	80	0.450	70	0.984	105	0.974
30	60.510	82	0.450	72	0.984	110	0.937
35	60.330	84	0.450	74	0.984	115	0.901
40	60.170	86	0.450	76	0.984	120	0.868
45	60.000			78	0.984		
50	59.830			80	0.984		
55	59.660			82	0.984		
60	59.500			84	0.984		
65	59.330			86	0.984		
				88	0.984		

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	20.000	35	0.004	35	0.00006		N
		40	0.005	40	0.00008		O
		45	0.006	45	0.00010		T
		50	0.008	50	0.00013		
		55	0.010	55	0.00016		P
		60	0.013	60	0.00020		E
		65	0.016	65	0.00025		R
		70	0.020	70	0.00031		T
		75	0.025	75	0.00038		I
		80	0.031	80	0.00047		N
		85	0.038	85	0.00057		E
		90	0.046	90	0.00069		N
		95	0.057	95	0.00084		T
		100	0.069	100	0.00101		
		105	0.083	105	0.00121		
		110	0.100	110	0.00144		
		115	0.120	115	0.00171		
		120	0.143	120	0.00203		
		125	0.171	125	0.00240		
		130	0.203	130	0.00282		
		135	0.239	135	0.00330		
		140	0.282	140	0.00385		
		145	0.331	145	0.00448		
		150	0.387	150	0.00520		
		155	0.451	155	0.00602		
		160	0.524	160	0.00694		