

# ISOPHORONE

IPH

## CAUTIONARY RESPONSE INFORMATION

<b>Common Synonyms</b> 3,5,5-Trimethyl-2-cyclohexane-1-one				Liquid	Colorless	Camphor-like odor
Floats and mixes slowly with water.						
<p style="color: red;">Keep people away. Call fire department. Notify local health and pollution control agencies.</p>						
<b>Fire</b>	Combustible. Extinguish with dry chemicals, foam or carbon dioxide. Water may be ineffective on fire.					
<b>Exposure</b>	Call for medical aid.  LIQUID Irritating to 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.					
<b>Water Pollution</b>	Effect of low concentrations on aquatic life is unknown. Fouling to shoreline. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.					

<p><b>1. CORRECTIVE RESPONSE ACTIONS</b></p> Stop discharge Contain Collection Systems: Skim Chemical and Physical Treatment: Absorb Clean shore line	<p><b>2. CHEMICAL DESIGNATIONS</b></p> 2.1 <b>CG Compatibility Group:</b> 18; Ketone 2.2 <b>Formula:</b> COCH=C(CH <sub>3</sub> )CH <sub>2</sub> C(CH <sub>3</sub> ) <sub>2</sub> CH <sub>2</sub> 2.3 <b>IMO/UN Designation:</b> Not listed 2.4 <b>DOT ID No.:</b> Not listed 2.5 <b>CAS Registry No.:</b> 78-59-1 2.6 <b>NAERG Guide No.:</b> Not listed 2.7 <b>Standard Industrial Trade Classification:</b> 51628
<b>3. HEALTH HAZARDS</b>	
<p>3.1 <b>Personal Protective Equipment:</b> Self-contained breathing apparatus with full face mask; rubber gloves</p> <p>3.2 <b>Symptoms Following Exposure:</b> Inhalation irritates eye, nose and throat; causes central depression and has some anesthetic effect. Contact of liquid with eyes causes severe irritation and possible tissue damage. Skin is irritated by liquid and may crack on prolonged contact. Ingestion causes irritation of mouth and stomach.</p> <p>3.3 <b>Treatment of Exposure:</b> INHALATION: remove victim promptly from contaminated atmosphere; if breathing has stopped, give artificial respiration and oxygen. EYES: flood with water for at least 15 min.; consult an eye specialist as soon as possible. SKIN: flood with water. INGESTION: do NOT induce vomiting; call a doctor.</p> <p>3.4 <b>TLV-TWA:</b> Not listed.                  3.5 <b>TLV-STEL:</b> Not listed.                  3.6 <b>TLV-Ceiling:</b> 5 ppm.                  3.7 <b>Toxicity by Ingestion:</b> Grade 2; oral LD<sub>50</sub> = 2,330 mg/kg (rat)                  3.8 <b>Toxicity by Inhalation:</b> Currently not available.                  3.9 <b>Chronic Toxicity:</b> Currently not available                  3.10 <b>Vapor (Gas) Irritant Characteristics:</b> Vapors cause moderate irritation such that personnel will find high concentrations unpleasant. The effect is temporary.                  3.11 <b>Liquid or Solid Characteristics:</b> Causes smarting of the skin and first-degree burns on short exposure; may cause second-degree burns on long exposure.                  3.12 <b>Odor Threshold:</b> Currently not available                  3.13 <b>IDLH Value:</b> 200 ppm.                  3.14 <b>OSHA PEL-TWA:</b> 25 ppm.                  3.15 <b>OSHA PEL-STEL:</b> Not listed.                  3.16 <b>OSHA PEL-Ceiling:</b> Not listed.                  3.17 <b>EPA AEGL:</b> Not listed</p>	

<p><b>4. FIRE HAZARDS</b></p> 4.1 <b>Flash Point:</b> 205°F O.C. 184°F C.C. 4.2 <b>Flammable Limits in Air:</b> 0.84%-3.8% 4.3 <b>Fire Extinguishing Agents:</b> Dry chemical, foam, carbon dioxide 4.4 <b>Fire Extinguishing Agents Not to Be Used:</b> Water may be ineffective 4.5 <b>Special Hazards of Combustion Products:</b> Not pertinent 4.6 <b>Behavior in Fire:</b> Not pertinent 4.7 <b>Auto Ignition Temperature:</b> 864°F 4.8 <b>Electrical Hazards:</b> Currently not available 4.9 <b>Burning Rate:</b> 4.0 mm/min. 4.10 <b>Adiabatic Flame Temperature:</b> Currently not available 4.11 <b>Stoichiometric Air to Fuel Ratio:</b> 57.1 (calc.) 4.12 <b>Flame Temperature:</b> Currently not available 4.13 <b>Combustion Molar Ratio (Reactant to Product):</b> 16.0 (calc.) 4.14 <b>Minimum Oxygen Concentration for Combustion (MOCC):</b> Not listed	<p><b>7. SHIPPING INFORMATION</b></p> 7.1 <b>Grades of Purity:</b> 99+% 7.2 <b>Storage Temperature:</b> Ambient 7.3 <b>Inert Atmosphere:</b> No requirement 7.4 <b>Venting:</b> Open (flame arrester) 7.5 <b>IMO Pollution Category:</b> D 7.6 <b>Ship Type:</b> Data not available 7.7 <b>Barge Hull Type:</b> Currently not available
<p><b>5. CHEMICAL REACTIVITY</b></p> 5.1 <b>Reactivity with Water:</b> No reaction 5.2 <b>Reactivity with Common Materials:</b> No reaction 5.3 <b>Stability During Transport:</b> Stable 5.4 <b>Neutralizing Agents for Acids and Caustics:</b> Not pertinent 5.5 <b>Polymerization:</b> Not pertinent 5.6 <b>Inhibitor of Polymerization:</b> Not pertinent	<p><b>8. HAZARD CLASSIFICATIONS</b></p> 8.1 <b>49 CFR Category:</b> Not listed 8.2 <b>49 CFR Class:</b> Not pertinent 8.3 <b>49 CFR Package Group:</b> Not listed. 8.4 <b>Marine Pollutant:</b> No 8.5 <b>NFPA Hazard Classification:</b>
<p><b>6. WATER POLLUTION</b></p> 6.1 <b>Aquatic Toxicity:</b> 430 ppm/24 hr/brine shrimp/TL <sub>m</sub> 6.2 <b>Waterfowl Toxicity:</b> Currently not available 6.3 <b>Biological Oxygen Demand (BOD):</b> Currently not available 6.4 <b>Food Chain Concentration Potential:</b> None 6.5 <b>GESAMP Hazard Profile:</b> Bioaccumulation: 0 Damage to living resources: 2 Human Oral hazard: 1 Human Contact hazard: II Reduction of amenities: XX	<p><b>9. PHYSICAL &amp; CHEMICAL PROPERTIES</b></p> 9.1 <b>Physical State at 15° C and 1 atm:</b> Liquid 9.2 <b>Molecular Weight:</b> 138.2 9.3 <b>Boiling Point at 1 atm:</b> 419.5°F = 215.3°C = 488.5°K 9.4 <b>Freezing Point:</b> 17.4°F = -8.1°C = 265.1°K 9.5 <b>Critical Temperature:</b> Not pertinent 9.6 <b>Critical Pressure:</b> Not pertinent 9.7 <b>Specific Gravity:</b> 0.921 at 25°C (liquid) 9.8 <b>Liquid Surface Tension:</b> 32.3 dynes/cm = 0.0323 N/m at 20°C 9.9 <b>Liquid Water Interfacial Tension:</b> Not pertinent 9.10 <b>Vapor (Gas) Specific Gravity:</b> 4.75 9.11 <b>Ratio of Specific Heats of Vapor (Gas):</b> Not pertinent 9.12 <b>Latent Heat of Vaporization:</b> 135 Btu/lb = 75 cal/g = 3.14 X 10 <sup>5</sup> J/kg 9.13 <b>Heat of Combustion:</b> -16,170 Btu/lb = -8,980 cal/g = -376 X 10 <sup>3</sup> J/kg 9.14 <b>Heat of Decomposition:</b> Not pertinent 9.15 <b>Heat of Solution:</b> Not pertinent 9.16 <b>Heat of Polymerization:</b> Not pertinent 9.17 <b>Heat of Fusion:</b> Currently not available 9.18 <b>Limiting Value:</b> Currently not available 9.19 <b>Reid Vapor Pressure:</b> Low
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
65	57.580	65	0.454	42	1.048	65	2.855
70	57.470	70	0.454	44	1.048	70	2.682
75	57.360	75	0.455	46	1.048	75	2.522
80	57.250	80	0.455	48	1.048	80	2.374
85	57.140	85	0.455	50	1.048	85	2.238
90	57.020	90	0.455	52	1.048	90	2.112
95	56.900	95	0.456	54	1.048	95	1.995
100	56.770	100	0.456	56	1.048	100	1.886
105	56.640	105	0.456	58	1.048	105	1.785
110	56.510	110	0.457	60	1.048	110	1.691
115	56.380	115	0.457	62	1.048	115	1.604
120	56.240	120	0.457	64	1.048	120	1.522
125	56.100	125	0.457	66	1.048	125	1.446
		130	0.458	68	1.048		
				70	1.048		
				72	1.048		
				74	1.048		
				76	1.048		

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
34	1.483	150	0.065	150	0.00138	0	0.271
36	1.467	160	0.088	160	0.00182	20	0.283
38	1.450	170	0.117	170	0.00238	40	0.296
40	1.433	180	0.154	180	0.00309	60	0.308
42	1.417	190	0.201	190	0.00398	80	0.320
44	1.400	200	0.260	200	0.00507	100	0.332
46	1.383	210	0.334	210	0.00642	120	0.343
48	1.367	220	0.425	220	0.00807	140	0.355
50	1.350	230	0.540	230	0.01008	160	0.366
52	1.333	240	0.680	240	0.01251	180	0.377
54	1.317	250	0.850	250	0.01542	200	0.388
56	1.300	260	1.056	260	0.01889	220	0.398
58	1.283	270	1.304	270	0.02301	240	0.409
60	1.267	280	1.602	280	0.02788	260	0.419
62	1.250	290	1.957	290	0.03360	280	0.429
64	1.233	300	2.377	300	0.04029	300	0.439
66	1.217					320	0.449
68	1.200					340	0.458
70	1.183					360	0.467
72	1.167					380	0.476
74	1.150					400	0.485
76	1.133					420	0.494
78	1.117					440	0.503
80	1.100						
82	1.083						
84	1.067						