

# NAPHTHALENE

NTM

## CAUTIONARY RESPONSE INFORMATION

<b>Common Synonyms</b>		Solid	Colorless	Mothballs odor
Naphthalin Tar camphor		Solidifies and floats or sinks in water.		
<p>Keep people away. Avoid inhalation. Call fire department. Avoid contact with liquid and solid. Notify local health and pollution control agencies.</p>				
<b>Fire</b>	Combustible. Wear goggles and self-contained breathing apparatus. Extinguish with water, foam, dry chemical or carbon dioxide. Cool exposed containers with water.			
<b>Exposure</b>	CALL FOR MEDICAL AID.  SOLID OR LIQUID Irritating to skin and eyes. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water.			
<b>Water Pollution</b>	HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS. 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 Collection Systems: Skim; Dredge Clean shore line Salvage waterfowl	<p><b>2. CHEMICAL DESIGNATIONS</b></p> <p>2.1 <b>CG Compatibility Group:</b> 32; Aromatic Hydrocarbon</p> <p>2.2 <b>Formula:</b> C<sub>10</sub>H<sub>8</sub></p> <p>2.3 <b>IMO/UN Designation:</b> 4.1/2304</p> <p>2.4 <b>DOT ID No.:</b> 1334 (crude/refined); 2304 (molten)</p> <p>2.5 <b>CAS Registry No.:</b> 91-20-3</p> <p>2.6 <b>NAERG Guide No.:</b> 133</p> <p>2.7 <b>Standard Industrial Trade Classification:</b> 51129</p>
<p><b>3. HEALTH HAZARDS</b></p> <p>3.1 <b>Personal Protective Equipment:</b> Approved organic vapor canister unit; rubber gloves; chemical safety goggles; face shield; coveralls and/or rubber apron; rubber shoes or boots.</p> <p>3.2 <b>Symptoms Following Exposure:</b> Vapors or fumes are irritating to eyes, nose, and throat and may cause headaches, dizziness, nausea, etc. Solid may be irritating to skin.</p> <p>3.3 <b>Treatment of Exposure:</b> INHALATION: remove to fresh air. SKIN OR EYES: flush immediately with plenty of water for at least 15 min.; remove contaminated clothing immediately; call a physician.</p> <p>3.4 <b>TLV-TWA:</b> 10 ppm</p> <p>3.5 <b>TLV-STEL:</b> 15 ppm</p> <p>3.6 <b>TLV-Ceiling:</b> Not listed.</p> <p>3.7 <b>Toxicity by Ingestion:</b> Grade 2; oral rat LD<sub>50</sub> = 1780 mg/kg</p> <p>3.8 <b>Toxicity by Inhalation:</b> Currently not available.</p> <p>3.9 <b>Chronic Toxicity:</b> Currently not available</p> <p>3.10 <b>Vapor (Gas) Irritant Characteristics:</b> Vapors cause moderate irritation such that personnel will find high concentrations unpleasant. The effect is temporary.</p> <p>3.11 <b>Liquid or Solid Characteristics:</b> Hot liquid can cause severe burn. The solid may irritate the skin.</p> <p>3.12 <b>Odor Threshold:</b> Currently not available</p> <p>3.13 <b>IDLH Value:</b> 250 ppm</p> <p>3.14 <b>OSHA PEL-TWA:</b> 10 ppm.</p> <p>3.15 <b>OSHA PEL-STEL:</b> Not listed.</p> <p>3.16 <b>OSHA PEL-Ceiling:</b> Not listed.</p> <p>3.17 <b>EPA AEG:</b> Not listed</p>	

## 4. FIRE HAZARDS

- 4.1 **Flash Point:** 190°F O.C. 174°F C.C.
- 4.2 **Flammable Limits in Air:** 0.9%-5.9%
- 4.3 **Fire Extinguishing Agents:** Water fog, carbon dioxide, dry chemical, or foam
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Not pertinent
- 4.5 **Special Hazards of Combustion Products:** Toxic vapors given off in a fire.
- 4.6 **Behavior in Fire:** Not pertinent
- 4.7 **Auto Ignition Temperature:** 979°F
- 4.8 **Electrical Hazards:** Not pertinent
- 4.9 **Burning Rate:** 4.3 mm/min.
- 4.10 **Adiabatic Flame Temperature:** Currently not available
- 4.11 **Stoichiometric Air to Fuel Ratio:** 57.1 (calc.)
- 4.12 **Flame Temperature:** Currently not available
- 4.13 **Combustion Molar Ratio (Reactant to Product):** 14.0 (calc.)
- 4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

## 5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** Molten naphthalene splatters and foams in contact with water. No chemical reaction is involved.
- 5.2 **Reactivity with Common Materials:** None
- 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:** 150 mg/l/96 hr/sunfish/TLW/fresh water  
1.8 ppm/72 hr/fingerling salmon/critical/salt water
- 6.2 **Waterfowl Toxicity:** Currently not available
- 6.3 **Biological Oxygen Demand (BOD):** (theor.) 59.5%, 6 days
- 6.4 **Food Chain Concentration Potential:** None
- 6.5 **GESAMP Hazard Profile:**  
Bioaccumulation: T  
Damage to living resources: 3  
Human Oral hazard: 2  
Human Contact hazard: 1  
Reduction of amenities: X

## 7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Pure; crude: 95% Pure: mp = 176°F Crude: mp = 165-176°F
- 7.2 **Storage Temperature:** Elevated
- 7.3 **Inert Atmosphere:** No requirement
- 7.4 **Venting:** Open (flame arrester) or pressure-vacuum
- 7.5 **IMO Pollution Category:** A
- 7.6 **Ship Type:** 2
- 7.7 **Barge Hull Type:** Currently not available

## 8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Flammable solid
- 8.2 **49 CFR Class:** 4.1
- 8.3 **49 CFR Package Group:** III
- 8.4 **Marine Pollutant:** Yes
- 8.5 **NFPA Hazard Classification:**
- | Category             | Classification |
|----------------------|----------------|
| Health Hazard (Blue) | 2              |
| Flammability (Red)   | 2              |
| Instability (Yellow) | 0              |
- 8.6 **EPA Reportable Quantity:** 100 pounds
- 8.7 **EPA Pollution Category:** B
- 8.8 **RCRA Waste Number:** U165
- 8.9 **EPA FWPCA List:** Yes

## 9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Solid
- 9.2 **Molecular Weight:** 128.18
- 9.3 **Boiling Point at 1 atm:** 424°F = 218°C = 491°K
- 9.4 **Freezing Point:** 176.4°F = 80.2°C = 353.4°K
- 9.5 **Critical Temperature:** 887.4°F = 475.2°C = 748.4°K
- 9.6 **Critical Pressure:** 588 psia = 40.0 atm = 4.05 MN/m<sup>2</sup>
- 9.7 **Specific Gravity:** 1.145 at 20°C (solid)
- 9.8 **Liquid Surface Tension:** 31.8 dynes/cm = 0.0318 N/m at 100°C
- 9.9 **Liquid Water Interfacial Tension:** Currently not available
- 9.10 **Vapor (Gas) Specific Gravity:** Not pertinent
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.068
- 9.12 **Latent Heat of Vaporization:** 145 Btu/lb = 80.7 cal/g = 3.38 X 10<sup>5</sup> J/kg
- 9.13 **Heat of Combustion:** -16,720 Btu/lb = -9287 cal/g = -388.8 X 10<sup>5</sup> 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:** 35.06 cal/g
- 9.18 **Limiting Value:** Currently not available
- 9.19 **Reid Vapor Pressure:** 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
177	69.290	180	0.382	177	0.901	180	0.837
178	69.290	200	0.391	178	0.901	185	0.784
179	69.290	220	0.401	179	0.901	190	0.735
180	69.290	240	0.410	180	0.901	195	0.690
181	69.290	260	0.419	181	0.901	200	0.648
182	69.290	280	0.429	182	0.901	205	0.609
183	69.290	300	0.438	183	0.901	210	0.573
184	69.290	320	0.447	184	0.901	215	0.540
185	69.290	340	0.457	185	0.901	220	0.509
186	69.290	360	0.466	186	0.901	225	0.480
187	69.290	380	0.475	187	0.901	230	0.454
188	69.290	400	0.485	188	0.901	235	0.429
189	69.290	420	0.494	189	0.901	240	0.406
190	69.290			190	0.901	245	0.384
191	69.290			191	0.901	250	0.364
192	69.290			192	0.901	255	0.345
193	69.290			193	0.901	260	0.327
						265	0.311
						270	0.295
						275	0.281
						280	0.267
						285	0.254
						290	0.242
						295	0.231
						300	0.221
						305	0.210

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	0.300	180	0.148	180	0.00276	0	0.207
		200	0.254	200	0.00460	25	0.220
		220	0.420	220	0.00739	50	0.233
		240	0.670	240	0.01143	75	0.246
		260	1.032	260	0.01713	100	0.259
		280	1.544	280	0.02493	125	0.271
		300	2.250	300	0.03537	150	0.283
		320	3.200	320	0.04901	175	0.295
		340	4.453	340	0.06650	200	0.307
		360	6.075	360	0.08850	225	0.318
		380	8.138	380	0.11570	250	0.330
		400	10.720	400	0.14890	275	0.340
		420	13.910	420	0.18890	300	0.351
		440	17.810	440	0.23630	325	0.362
		460	22.490	460	0.29210	350	0.372
		480	28.080	480	0.35680	375	0.382
						400	0.391
						425	0.401
						450	0.410
						475	0.419
						500	0.428
						525	0.436
						550	0.445
						575	0.453
						600	0.460