

PHENOL

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CAUTIONARY RESPONSE INFORMATION

Common Synonyms	Solid crystals; or watery liquid	White solid, or light pink liquid	Sweet tarry odor
Carbolic acid Hydroxybenzene Phenic acid Phenyl hydroxide	May float or sink, and mixes slowly with water.		
<p>Keep people away. AVOID CONTACT WITH LIQUID AND SOLID. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Call fire department. Evacuate area in case of large discharge. Notify local health and pollution control agencies. Protect water intakes.</p>			
Fire	Combustible. POISONOUS GASES ARE PRODUCED IN FIRE. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Extinguish with water, carbon dioxide, dry chemical, or foam. Cool exposed containers with water.		
Exposure	CALL FOR MEDICAL AID. LIQUID OR SOLID POISONOUS IF SWALLOWED. Will burn 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. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. DO NOT INDUCE VOMITING.		
Water Pollution	HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.		

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge
Collection Systems: Pump; Dredge
Do not burn

2. CHEMICAL DESIGNATIONS

- 2.1 CG Compatibility Group: 21; Phenol, cresol
2.2 Formula: C₆H₅OH
2.3 IMO/UN Designation: 9.0/1671
2.4 DOT ID No.: 1671
2.5 CAS Registry No.: 108-95-2
2.6 NAERG Guide No.: 153
2.7 Standard Industrial Trade Classification: 51241

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Fresh-air mask for confined areas; rubber gloves; protective clothing; full face shield.
3.2 **Symptoms Following Exposure:** Will burn eyes and skin. The analgesic action may cause loss of pain sensation. Readily absorbed through skin, causing increase in heart rate, convulsions, and death.
3.3 **Treatment of Exposure:** INHALATION: if victim shows any ill effects, move him to fresh air, keep him quiet and warm, and call a doctor immediately; if breathing stops, give artificial respiration. INGESTION: do NOT induce vomiting; give milk, egg whites, or large amounts of water and call doctor immediately; no known antidote; treat the symptoms. EYES: immediately flush with plenty of water for at least 15 min.; continue for another 15 min. if doctor has not taken over. SKIN: immediately remove all clothing while in a shower and wash affected area with abundant flowing water or soap and water for at least 15 min.; clean clothing thoroughly or discard.
3.4 TLV-TWA: 5 ppm
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Grade 2; LD₅₀ = 0.5 to 5 g/kg (rat)
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Carcinogenic in laboratory animals
3.10 **Vapor (Gas) Irritant Characteristics:** Vapors cause moderate irritation such that personnel will find high concentrations unpleasant. The effect is temporary.
3.11 **Liquid or Solid Characteristics:** Fairly severe skin irritant; may cause pain and second-degree burns after a few minutes' contact.
3.12 **Odor Threshold:** 0.05 ppm
3.13 IDLH Value: 250 ppm
3.14 OSHA PEL-TWA: 5 ppm
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: 185°F O.C. 175°F C.C.
4.2 Flammable Limits in Air: 1.7%-8.6%
4.3 Fire Extinguishing Agents: Water fog, foam, carbon dioxide, or dry chemical
4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent
4.5 Special Hazards of Combustion Products: Toxic and irritating vapors are generated when heated.
4.6 Behavior in Fire: Yields flammable vapors when heated which will form explosive mixtures with air.
4.7 Auto Ignition Temperature: 1319°F
4.8 Electrical Hazards: Not pertinent
4.9 Burning Rate: 3.5 mm/min.
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichiometric Air to Fuel Ratio: 33.3 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 9.0 (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: No reaction
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: 11.5-28.5 mg/l/96 hr/bluegill/TL_m/fresh water
1.5 ppm/48 hr/rainbow trout/TL_m/fresh water
6.2 Waterfowl Toxicity: Currently not available
6.3 Biological Oxygen Demand (BOD): 200%, 5 days
6.4 Food Chain Concentration Potential: None
6.5 GESAMP Hazard Profile: Bioaccumulation: 0
Damage to living resources: 2
Human Oral hazard: 2
Human Contact hazard: II
Reduction of amenities: XX

7. SHIPPING INFORMATION

- 7.1 Grades of Purity: 90-99% (solid), 60-85% (liquid). Technical: 82-92% (contains cresols)
7.2 Storage Temperature: Ambient
7.3 Inert Atmosphere: No requirement
7.4 Venting: Pressure-vacuum
7.5 IMO Pollution Category: B
7.6 Ship Type: 2
7.7 Barge Hull Type: 1

8. HAZARD CLASSIFICATIONS

- 8.1 49 CFR Category: Poison
8.2 49 CFR Class: 6.1
8.3 49 CFR Package Group: II
8.4 Marine Pollutant: No
8.5 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue).....	4
Flammability (Red).....	2
Instability (Yellow).....	0

8.6 EPA Reportable Quantity: 1000 pounds
8.7 EPA Pollution Category: C
8.8 RCRA Waste Number: U188
8.9 EPA FWPCA List: Yes

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 Physical State at 15° C and 1 atm: Solid or liquid
9.2 Molecular Weight: 94.11
9.3 Boiling Point at 1 atm: 359.2°F = 181.8°C = 455.0°K
9.4 Freezing Point: 105.6°F = 40.9°C = 314.1°K
9.5 Critical Temperature: 790.0°F = 421.1°C = 694.3°K
9.6 Critical Pressure: 889 psia = 60.5 atm = 6.13 MN/m²
9.7 Specific Gravity: 1.058 at 41°C (liquid)
9.8 Liquid Surface Tension: 36.5 dynes/cm = 0.0365 N/m at 55°C
9.9 Liquid Water Interfacial Tension: (est.) 20 dynes/cm = 0.02 N/m at 42°C
9.10 Vapor (Gas) Specific Gravity: Not pertinent
9.11 Ratio of Specific Heats of Vapor (Gas): 1.089
9.12 Latent Heat of Vaporization: 130 Btu/lb = 72 cal/g = 3.0 X 10⁵ J/kg
9.13 Heat of Combustion: -13,400 Btu/lb = -7,445 cal/g = -311.7 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: Currently not available
9.18 Limiting Value: Currently not available
9.19 Reid Vapor Pressure: 0.3 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
110	65.870	108	0.561	122	1.113	110	4.302
115	65.719	109	0.561			115	3.929
120	65.559	110	0.561			120	3.594
125	65.410	111	0.561			125	3.292
130	65.250	112	0.561			130	3.021
135	65.099	113	0.561			135	2.775
140	64.940	114	0.561			140	2.554
145	64.790	115	0.561			145	2.353
150	64.629	116	0.561			150	2.171
155	64.469	117	0.561			155	2.005
160	64.309	118	0.561			160	1.855
165	64.160	119	0.561			165	1.718
170	64.000	120	0.561			170	1.593
175	63.840	121	0.561			175	1.479
180	63.670	122	0.561				
185	63.510	123	0.561				
190	63.350	124	0.561				
195	63.190	125	0.561				
200	63.020	126	0.561				
205	62.860	127	0.561				
210	62.690	128	0.561				
		129	0.561				
		130	0.561				
		131	0.561				
		132	0.561				
		133	0.561				

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	8.400	70	0.012	70	0.00019	0	0.224
		80	0.017	80	0.00027	25	0.237
		90	0.024	90	0.00039	50	0.250
		100	0.034	100	0.00054	75	0.262
		110	0.048	110	0.00074	100	0.274
		120	0.066	120	0.00100	125	0.286
		130	0.091	130	0.00135	150	0.297
		140	0.123	140	0.00180	175	0.309
		150	0.165	150	0.00238	200	0.319
		160	0.220	160	0.00311	225	0.330
		170	0.289	170	0.00403	250	0.341
		180	0.378	180	0.00518	275	0.351
		190	0.490	190	0.00661	300	0.360
		200	0.629	200	0.00836	325	0.370
		210	0.802	210	0.01050	350	0.379
		220	1.016	220	0.01311	375	0.388
		230	1.278	230	0.01624	400	0.397
		240	1.596	240	0.02000	425	0.405
		250	1.982	250	0.02449	450	0.414
		260	2.446	260	0.02980	475	0.422
		270	3.002	270	0.03607	500	0.429
		280	3.663	280	0.04342	525	0.436
		290	4.446	290	0.05200	550	0.444
		300	5.370	300	0.06197	575	0.450
		310	6.453	310	0.07350	600	0.457
		320	7.718	320	0.08679		