CRESOLS

CRS

CAUTIONARY RESPONSE INFORMATION

Common Synonyms			
Cresylic acids Hydroxytoluenes Methylphenols Oxytoluenes Tar acids	Watery liquid, or solid crystals Sinks in water.	Colorless or yellow	Sweet tarry odor

Keep people away. Avoid contact with liquid.
Avoid inhalation.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Shut off ignition sources and call fire department.
Notify local health and pollution control agencies.
Protect water intakes.

Fire	Combustible. POISONOUS GASES MAY BE PRODUCED IN FIRE. Wear goggles and self-contained breathing apparatus. Extinguish with water, dry chemical, foam or carbon dioxide. Cool exposed containers with water.
Exposure	CALL FOR MEDICAL AID. 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	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
Contain
Collection Systems: Pump; Dredge
Do not burn
Clean shore line

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: 21; Phenols, Creosols
2.2 Formula: $CH_3C_6H_4OH$
2.3 IMO/UN Designation: 9.0/2076
2.4 DOT ID No.: 2076
2.5 CAS Registry No.: 1319-77-3
2.6 NAERG Guide No.: 153
2.7 Standard Industrial Trade Classification: 51242

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Organic vapor canister unit (USBM Type B) approved by U.S. Bureau of Mines. Rubber gloves; chemical safety goggles; face shield; coveralls and/or rubber apron; rubber shoes or boots.
3.2 Symptoms Following Exposure: Vapors cause irritation of eyes, nose, and throat. Contact with skin or eyes causes severe burns. Chemical is rapidly absorbed through skin.
3.3 Treatment of Exposure: Call a physician. INHALATION: remove to fresh air. INGESTION: have victim drink water or milk; do NOT induce vomiting. SKIN OR EYES: flush immediately with plenty of water for at least 15 min.; remove contaminated clothing immediately and wash before reuse; discard contaminated shoes.
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; LD_{50} = 0.5 to 5 g/kg (rat, rabbit)
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Currently not available
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: 5 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: 175-185°F O.C.; 178°F C.C.
4.2 Flammable Limits in Air: LEL: 1.4% (ortho); 1.1% (meta or para)
4.3 Fire Extinguishing Agents: Water, dry chemical, carbon dioxide, and foam
4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent
4.5 Special Hazards of Combustion Products: Flammable toxic vapors given off in a fire.
4.6 Behavior in Fire: Sealed closed containers can build up pressure if exposed to heat
4.7 Auto Ignition Temperature: 1110°F (o-cresol) 1038°F (m- or p-cresol)
4.8 Electrical Hazards: Currently not available
4.9 Burning Rate: Currently not available
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric Air to Fuel Ratio: 40.5 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 11.0 (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: 24 mg/l/96 hr/bluegill/TL_m/fresh water
10-100 ppm/48 hr/shrimp/LC_{50}/salt water
6.2 Waterfowl Toxicity: Currently not available
6.3 Biological Oxygen Demand (BOD): m-cresol: 170%, 5 days o-cresol: 164%, 5 days p-cresol: 144%, 5 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: II
Reduction of amenities: XXX

7. SHIPPING INFORMATION

7.1 Grades of Purity: USP Liquid (mixed isomers) Phenol-cresol mixtures Ortho-cresol 80 to 98% containing phenol Meta-cresol 60 to 98% containing other cresols and xylenols Para-cresol 92 to 98% containing meta- cresol Meta-para-cresol containing ortho- cresol and xylenols ``Resin'' cresols containing phenols and xylenols Cresylic acids containing xylenols, cresols and phenols
7.2 Storage Temperature: Ambient
7.3 Inert Atmosphere: No requirement
7.4 Venting: Open
7.5 IMO Pollution Category: A
7.6 Ship Type: 2
7.7 Barge Hull Type: 3

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: Yes
8.5 NFPA Hazard Classification:

Category	Classification	
Health Hazard (Blue).....	3	3
Flammability (Red).....	2	1
Instability (Yellow).....	0	0

8.6 EPA Reportable Quantity: 100 pounds
8.7 EPA Pollution Category: B
8.8 RCRA Waste Number: U052
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: 108.13
9.3 Boiling Point at 1 atm: 376°F = 191°C = 464°K
9.4 Freezing Point: Varies with composition
9.5 Critical Temperature: Not pertinent
9.6 Critical Pressure: Not pertinent
9.7 Specific Gravity: 1.03-1.07 at 20°C (liquid)
9.8 Liquid Surface Tension: 37 dynes/cm = 0.037 N/m at 20°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): 1.073
9.12 Latent Heat of Vaporization: (est.) 200 Btu/lb = 110 cal/g = 4.6 X 10^5 J/kg
9.13 Heat of Combustion: –14,720 to –14,740 Btu/lb = –8180 to –8190 cal/g = –342.5 to –342.9 X 10^5 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: 26.28 cal/g (p-Cresol)
9.18 Limiting Value: Currently not available
9.19 Reid Vapor Pressure: 0.03 psia

NOTES

CRESOLS

9.20 SATURATED LIQUID DENSITY

Temperature (degrees F)	Pounds per cubic foot
35	65.469
40	65.349
45	65.230
50	65.110
55	64.990
60	64.860
65	64.740
70	64.620
75	64.500
80	64.379
85	64.259
90	64.139
95	64.009
100	63.890

9.21 LIQUID HEAT CAPACITY

Temperature (degrees F)	British thermal unit per pound-F
46	0.490
48	0.490
50	0.490
52	0.490
54	0.490
56	0.490
58	0.490
60	0.490
62	0.490
64	0.490
66	0.490
68	0.490
70	0.490
72	0.490
74	0.490
76	0.490
78	0.490
80	0.490
82	0.490
84	0.490
86	0.490
88	0.490
90	0.490
92	0.490
94	0.490
96	0.490

9.22 LIQUID THERMAL CONDUCTIVITY

Temperature (degrees F)	British thermal unit inch per hour-square foot-F
52	1.048
54	1.048
56	1.048
58	1.048
60	1.048
62	1.048
64	1.048
66	1.048
68	1.048
70	1.048
72	1.048
74	1.048
76	1.048
78	1.048
80	1.048
82	1.048
84	1.048
86	1.048
88	1.048
90	1.048
92	1.048
94	1.048
96	1.048
98	1.048
100	1.048
102	1.048

9.23 LIQUID VISCOSITY

Temperature (degrees F)	Centipoise
40	15.050
50	12.020
60	9.678
70	7.858
80	6.430
90	5.300
100	4.399
110	3.675
120	3.089
130	2.612
140	2.221
150	1.899
160	1.632
170	1.409
180	1.222
190	1.064
200	0.931
210	0.818

9.24 SOLUBILITY IN WATER

Temperature (degrees F)	Pounds per 100 pounds of water
68	2.200

9.25 SATURATED VAPOR PRESSURE

Temperature (degrees F)	Pounds per square inch
40	0.004
60	0.008
80	0.017
100	0.034
120	0.062
140	0.111
160	0.192
180	0.319
200	0.514
220	0.805
240	1.230
260	1.835
280	2.679
300	3.834
320	5.387
340	7.442

9.26 SATURATED VAPOR DENSITY

Temperature (degrees F)	Pounds per cubic foot
40	0.00008
60	0.00016
80	0.00032
100	0.00060
120	0.00109
140	0.00187
160	0.00312
180	0.00502
200	0.00785
220	0.01193
240	0.01771
260	0.02568
280	0.03648
300	0.05084
320	0.06960
340	0.09374

9.27 IDEAL GAS HEAT CAPACITY

Temperature (degrees F)	British thermal unit per pound-F
0	0.236
20	0.246
40	0.257
60	0.267
80	0.276
100	0.286
120	0.296
140	0.305
160	0.314
180	0.323
200	0.332
220	0.341
240	0.350
260	0.358
280	0.366
300	0.375
320	0.382
340	0.390
360	0.398
380	0.405
400	0.413
420	0.420
440	0.427