

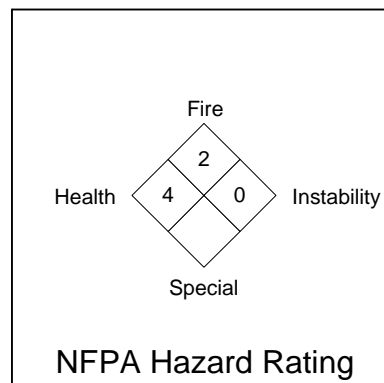
**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

**Product name**

**Phenol**

**Effective date**

August 2007



**Synonyms**

Carbolic acid, hydroxybenzene, monohydroxybenzene, oxybenzene, phenic acid, phenyl hydrate, phenyl hydroxide, phenylic acid, phenylic alcohol

**Chemical formula**

C<sub>6</sub>H<sub>5</sub>OH

**CAS name & no.**

Phenol, 108-95-2

**Manufacturer's name and address**

Georgia Gulf Chemicals and Vinyls, LLC  
P.O. Box 629  
Plaquemine, LA USA 70765-0629

**Emergency telephone number**

For transportation emergencies:  
CHEMTREC (800) 424-9300  
For all other emergencies: (225) 685-2500

**MSDS contact**

Corporate Health & Safety Department  
P.O. Box 629  
Plaquemine, LA USA 70765-0629  
Phone Number (225) 685-2500

**Material Safety Data Sheet: Phenol****2. COMPOSITION/INFORMATION ON INGREDIENTS**

<b>Component</b>	<b>CAS No.</b>	<b>Wt. %.</b>
Phenol	108-95-2	99.9

**3. HAZARDS IDENTIFICATION****PRECAUTIONARY INFORMATION**

**Combustible liquid can be fatal by inhalation, ingestion and by skin absorption. Highly toxic by skin absorption. Severe eye and skin burns. Known liver toxin.**

**Primary Routes of Entry**

Inhalation, ingestion, skin absorption, and eye contact.

**HAZARD CLASSIFICATION****Acute Effects**

Phenol is an irritant of the eyes, mucous membranes, and skin. Absorption is very rapid by any route of exposure, and can result in severe toxicity including death. Phenol acts upon the central nervous system causing excitation and convulsions followed by sudden collapse and unconsciousness. Death can be very rapid and is due to toxic effects on the central nervous system, the heart, lungs, kidneys, and blood vessels. Ingestion quickly results in burning of the mouth, mouth sores, diarrhea, and marked abdominal pain. Inhalation can result in lung irritation and pulmonary edema. Phenol may form methemoglobin which can result in a bluish tint (cyanosis) to the skin. Skin and eye exposure results in pain, then numbness, severe burns, and eschar formation. Contact with the eyes can cause severe corneal injury with permanent blindness.

**Chronic Effects**

Symptoms of chronic phenol poisoning include vomiting, difficulty in swallowing, diarrhea, lack of appetite, headache, fainting, dizziness, dark urine, and mental disturbances. Major damage to the liver, kidneys, and eyes can occur. Skin rashes and changes in skin pigmentation, especially over the knuckles of the hand, have been noted.

**Potential Adverse Chemical Interactions**

Persons with liver or kidney diseases should not be exposed to phenol for any length of time, even intermittently, since this chemical can damage these organs. Ethanol use may increase the liver damage caused by phenol. The combination of phenol and hydroquinone should be avoided since it has been found to be toxic to the blood-forming organs (in a manner similar to that of benzene) in experiments with animals.

**Carcinogen Status**

Phenol was found to induce skin tumors in mice exposed dermally (Cancer Research, Vol. 19, p. 413, 1959). However, this chemical is not considered to be carcinogenic by OSHA, NIOSH, NTP, IARC or EPA. IARC lists phenol in their Group 3 which is a category for substance unclassifiable as to their carcinogenicity.

## 4. FIRST AID MEASURES

### **Inhalation**

If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. Monitor the individual for respiratory distress. Emergency airway support and 100% humidified supplemental oxygen with assisted ventilation may be needed. If cough or respiratory distress ensues, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Get medical attention immediately.

### **Skin Contact**

Phenol spills on the skin, especially in high concentrations, are immediately life threatening and speed is essential for treatment. Immediately flush with large volumes of water while removing contaminated clothing. Continue to thoroughly wash with water for at least 15 minutes after clothing is removed. For additional treatment, an undiluted solution of polyethylene glycol (PEG) 300 or 400 can be dabbed on the skin. Emergency first aid personnel should wear butyl, viton or neoprene gloves. Dispose of all contaminated clothing, avoiding additional skin contact. Get medical attention at once.

### **Eye Contact**

If this chemical contacts the eyes, immediately wash the eyes with large amounts of water for at least 15 minutes, occasionally lifting the lower and upper lids. Get medical attention by an ophthalmologist immediately.

### **Ingestion**

Ingestion is immediately life threatening and speed is essential in treatment. Gastric lavage may be used if performed soon after ingestion. If used, activated charcoal should be administered as a slurry either aqueous or mixed with saline cathartic or sorbitol. Administer one dose of a cathartic, mixed with charcoal or given separately. Get medical attention immediately.

## 5. FIRE FIGHTING MEASURES

**Flash Point** 79°C (Closed cup)

### **Flammable Limits (% by Vol)**

Lower Explosive Limit (LEL) 1.7

Upper Explosive Limit (UEL) 8.6

**Auto-ignition Temperature** 715° C

### **Fire Fighting Procedures/Fire Extinguishing Media**

Keep unnecessary people away; isolate hazard area and deny entry. Avoid breathing vapors, stay upwind, out of low areas and ventilate closed spaces before entering. Use NIOSH approved self-contained respirators in the positive pressure mode, and chemical protective clothing. No skin areas should be exposed. Do not enter fire area without full bunker gear (helmet with face shield, bunker coats, gloves, and rubber boots). Use halon replacement or carbon dioxide extinguishers and water spray or alcohol foam for small fires. Large fires should be extinguished with alcohol foam, water spray, and fog. Fight fire from maximum distance. Use water spray to cool containers exposed to fire. Water containing phenol can cause chemical burns to personnel. Stay away from ends of tanks.

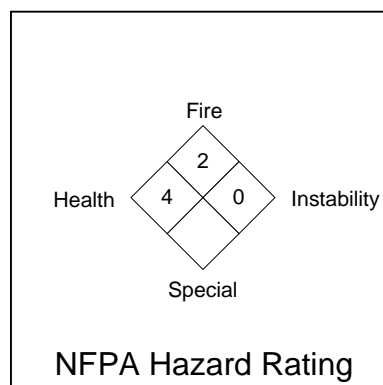
## 5. FIRE FIGHTING MEASURES (continued)

### Unusual Fire and Explosion Hazards

Phenol containers may explode violently in heat or flame. Phenol produces toxic and corrosive gases during combustion.

### National Fire Protection Association Hazard Rating

- 4 = Extreme
- 3 = High
- 2 = Moderate
- 1 = Slight
- 0 = Insignificant



## 6. ACCIDENTAL RELEASE MEASURES

Shut off all sources of ignition. Restrict access to spill area. Allow only trained personnel with appropriate respirator and full body protective clothing in the spill area. Highly toxic, do not touch spilled material; stop leak if you can do so without risk. Prevent phenol from entering water bodies, drains, or any sewage collection systems. For small spills take up with sand or other non-combustible absorbent material and place into containers for later disposal. Control large spills by diking and pump to salvage vessels. If material solidifies, shovel it into steel containers, or melt it with water and pump to tankage. Dispose all spill material in accordance with federal, state, and local regulations. Phenol spills over the reportable quantity (1,000 lbs.) should be reported to the National Response Center (800-424-8802).

## 7. HANDLING AND STORAGE

Store in accordance with 29 CFR 1910.106. Store away from sources of ignition and strong oxidizers in an area equipped with automatic sprinklers or fire extinguishing system. Ground and bond shipping container and transfer equipment to prevent possible ignition from static sparks. Wear appropriate protective equipment when handling phenol. Follow all federal, state, and local regulations as well as all insurance codes when storing and handling phenol.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Respiratory Protection

Use appropriate NIOSH approved respirator in accordance with 29 CFR 1910.132 and 1910.134, to prevent overexposure. Respirators must be selected based on the airborne levels found in the workplace and must not exceed the working limits of the respirator.

### Eye Protection

Use splash proof chemical safety goggles or appropriate full-face respirator. Follow eye and face protection guidelines of 29 CFR 1910.132 and 1910.133. Where there is any possibility that an individual's eyes may be exposed to phenol, an eye wash fountain (in accordance with 29 CFR 1910.151) should be within the immediate work area for emergency use.

### Protective Gloves

Use gloves in accordance with 29 CFR 1910.132 and 29 CFR 1910.138. Butyl, neoprene or Viton chemical protective gloves are recommended.

### Ventilation

Provide general and/or local ventilation to control airborne levels below exposure guidelines. Local exhaust ventilation should comply with OSHA regulations and the American Conference of Governmental Industrial Hygienists, Industrial Ventilation - A Manual of Recommended Practice.

### Occupational Exposure Guidelines for Phenol

<b>OSHA</b>	<b>PEL</b>	<b>5 ppm (skin)</b>
<b>ACGIH</b>	<b>TLV-TWA</b>	<b>5 ppm (skin)</b>
<b>NIOSH</b>	<b>REL (10hr TWA)</b>	<b>5 ppm (skin)</b>
	<b>IDLH</b>	<b>250 ppm</b>

### Other

Where there is a possibility of exposure of an individual's body to phenol, facilities for quick drenching of the body should be provided (in accordance with 29 CFR 1910.151). Such individuals should be provided with and required to use impervious clothing in accordance with 29 CFR 1910.132.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance</b>	Colorless solid or clear liquid
<b>Odor</b>	Sweet odor
<b>Molecular Weight</b>	94.1
<b>Boiling Point</b>	182° C
<b>Melting Point</b>	41° C
<b>Solubility</b>	Moderately soluble in water (8.4% @ 20°C), alcohol, ether, chloroform, ethyl acetate, toluene, and glycerol
<b>Specific Gravity (Water = 1.0)</b>	1.07 at 25/4° C
<b>Vapor Density (Air = 1.0)</b>	3.24
<b>Vapor Pressure</b>	0.357 mm Hg @ 20 °C 1 mm Hg @ 40° C
<b>pH</b>	<6 in 1/1 volume with water @ 25° C

NOTE: Phenol is shipped as a liquid. Phenol begins to solidify below 41° C.

## 10. STABILITY AND REACTIVITY

### Stability

Stable under normal conditions.

### Polymerization

Hazardous polymerization does not occur.

### Hazardous Decomposition Products

Carbon monoxide, irritating aldehydes, ketones and unidentified organic compounds may be formed during combustion.

### Incompatible Materials

Strong oxidizers, acid chlorides and acid anhydrides, halogens, especially calcium hypochlorite (contact with it may cause fires and explosions). Hot phenol attacks copper, aluminum, magnesium, lead, and zinc.

## 11. TOXICOLOGICAL INFORMATION

### Animal Toxicity

<b>Oral:</b>	Rat LD <sub>50</sub>	530 mg/kg
	Cat LD <sub>50</sub>	100 mg/kg
	Dog LD <sub>50</sub>	500 mg/kg
	Human LD <sub>LO</sub>	140 mg/kg
	Infant LD <sub>LO</sub>	10 mg/kg

## 11. TOXICOLOGICAL INFORMATION (continued)

<b>Dermal:</b>	Rat LD <sub>50</sub>	669 mg/kg
	Rabbit LD <sub>50</sub>	850 mg/kg

LD<sub>LO</sub> = Lowest lethal dose in a given species by a given route of exposure.

LD<sub>50</sub> = Dose that is lethal to 50% of a given species by a given route of exposure.

## 12. ECOLOGICAL INFORMATION

**Environmental Fate:** The following information on phenol is extracted from the TOXNET database maintained by the National Library of Medicine.

**Atmosphere:** According to a model of gas/particle partitioning of semivolatile organic compounds in the atmosphere, phenol, which has a vapor pressure of 0.350 mm Hg at 25 deg C will exist in the vapor phase in the ambient atmosphere. Vapor-phase phenol is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals during the day and nitrate radicals at night; the half-lives for these reactions in air is estimated as 14.6 hours and 12 minutes, respectively. Phenol has a low Henry's Law constant which explains why it is so effectively scavenged from the air by rain.

**Terrestrial:** Based on a recommended classification scheme, experimentally determined Koc values for phenol indicate that it would be highly mobile in soil and may leach. Phenol's vapor pressure, 0.350 mm Hg at 25 deg C and low adsorptivity to soil indicate that volatilization from dry soil and other surfaces may occur. Phenol will be primarily removed from soil as a result of biodegradation. Despite its high mobility in soil, biodegradation is sufficiently rapid that most groundwater is generally free of phenol. The half-lives of phenol in soil is usually <5 days, even in subsurface soil and aquifer material, although for acid soils and some surface soils the half-life may be of the order of 20-25 days and in the case of a till subsoil, 116 days.

**Aquatic:** Because the pKa of phenol is 9.994, it will be partially dissociated at higher pHs and therefore, its transport and reactivity may be pH dependent. Based on a recommended classification scheme, experimentally determined Koc values for phenol indicate that it would not adsorb to sediment and particulate matter in the water column. Phenol would not volatilize from water based on its Henry's Law constant of 3.33X10<sup>-7</sup> atm-cu m/mole. Its estimated volatilization half-life in a model river is 107 days. Removal will be primarily a result of biodegradation with complete degradation occurring in a few days. Degradation is slower in salt water; the degradation half-life in an estuarine river was 9 days.

**Biodegradation:** If released to the environment, phenol's primary removal mechanism is biodegradation which is generally rapid (days). Since phenol is a benchmark chemical for biodegradability studies, there is a large body of information on its degradation, which concludes that phenol rapidly degrades in sewage, soil, fresh water and seawater. Under anaerobic conditions degradation is slower and microbial adaptation periods longer.

**12. ECOLOGICAL INFORMATION (continued)****Ecotoxicity:**

TDLO Minnow 30 min 79 ug/l

LC50 Rainbow trout 5.6-11.3 mg/l/24 hr in a static bioassay.

LC50 Goldfish 60-200 mg/l/24 hr in a static bioassay.

LD0 Daphnia magna 16 mg/l /Conditions of bioassay not specified.

**13. DISPOSAL CONSIDERATIONS**

**Waste Management Information:** Any disposal practice must be in compliance with local, state and federal laws and regulations (contact local or state environmental agency for specific rules).

**14. TRANSPORTATION INFORMATION**

<b>Proper Shipping Name</b>	Phenol, Solid	Phenol, Molten	Phenol, Solutions
<b>DOT Hazard class</b>	6.1, (Poison)	6.1, (Poison)	6.1, (Poison)
<b>DOT Shipping I.D. No.</b>	UN 1671	UN 2312	UN 2821
<b>PG</b>	II	II	II
<b>DOT Labeling</b>	Poison	Poison	Poison
<b>DOT Placard</b>	Poison	Poison	Poison

**15. REGULATORY INFORMATION****SARA Title III**

Section 302 and 304 of the Act; Extremely Hazardous Substances (40 CFR 355)

COMPONENT	CAS No.	TPQ (lbs)	RQ (lbs)
Phenol	108-95-2	500*/10,000	1,000

\*TPQ = 500 lbs. if phenol is in powder form and has a particle size of less than 100 microns or is handled in solution or molten form or meets the criteria for a NFPA rating of 2, 3, or 4 for reactivity.

Note: TPQ-Threshold Planning Quantity                      RQ - Reportable Quantity

Section 311 Hazard Categorization (40 CFR 370)

ACUTE	CHRONIC	FIRE	PRESSURE	REACTIVE
X	X	X		

## 15. REGULATORY INFORMATION (continued)

Section 313 Toxic Chemicals (40 CFR 372.65)

COMPONENT	CAS No.	WT. %
Phenol	108-95-2	99.9

### CERCLA

Section 102(a) Hazardous Substances (40 CFR 302.4)

COMPONENT	CAS No.	WT. %	RQ (lbs)
Phenol	108-95-2	99.9	1,000

### RCRA

40 CFR 261.33 hazardous waste number:

Unused phenol product or phenol product that cannot meet specifications because of contamination would, when disposed of, be managed as a hazardous waste with the hazardous waste number U188.

### TSCA

Phenol is listed on the TSCA inventory.

### Proposition 65

Phenol is not listed on the California Proposition 65 list.

### Canada Regulations (WHMIS)

This product has been classified according to the hazard criteria of the Canadian Controlled Products Regulations, Section 33 and the MSDS contains all information required by this regulation.

Class B Division 3- Combustible Liquid; Class D Division 1 Subdivision A- Very Toxic Material

#### WHMIS Ingredient Disclosure List

Phenol	CAS 108-95-2	Cutoff- 1%
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### Canadian Environmental Protection Act (CEPA)

All substances in this product are listed on the Canadian Domestic Substances (DSL) list or are not required to be listed.

## 16. OTHER INFORMATION

**IMPORTANT:** The information and data herein are believed to be accurate and have been compiled from sources believed to be reliable. It is offered for your consideration, investigation and verification. Buyer assumes all risk of use, storage and handling of the product in compliance with applicable federal, state and local laws and regulations. **GEORGIA GULF CHEMICALS AND VINYLs, LLC MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, CONCERNING THE ACCURACY OR COMPLETENESS OF THE INFORMATION AND DATA HEREIN.** Georgia Gulf will not be liable for claims relating to any party's use of or reliance on information and data contained herein regardless of whether it is claimed that the information and data are inaccurate, incomplete or otherwise misleading. This information relates to the material designated and may not be valid for such material used in combination with any other materials nor in any process.

MSDS Status: Revision date 08/22/07 Supersedes 10/24/03