

Material Safety Data Sheet

Phenol

Section 1 - Chemical Product

MSDS Name: Phenol Liquid

Synonyms: Carboxylic acid; Phenyllic acid; Hydroxybenzene; Monohydroxybenzene; Phenyl hydroxide

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
108-95-2	Phenol	89	203-632-7
7732-18-5	Water	11	231-791-2
6153-56-6	Oxalic acid, dihydrate	0.01	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless liquid. Flash Point: 79.4 deg C.

Danger! May be fatal if inhaled, absorbed through the skin or swallowed. Causes digestive and respiratory tract burns. Causes eye and skin burns. Readily absorbed through the skin. **Combustible liquid and vapor.** May cause central nervous system depression. May cause liver and kidney damage. Air sensitive. Light sensitive. Hygroscopic (absorbs moisture from the air).

Target Organs: Blood, kidneys, central nervous system, liver, eyes, skin.

Potential Health Effects

Eye: Contact with liquid or vapor causes severe burns and possible irreversible eye damage.

Skin: May be fatal if absorbed through the skin. Direct skin contact results in white, wrinkled discoloration, followed by severe burns. Phenol may be absorbed through the skin rapidly to cause systemic poisoning and possible death due to effects on the CNS system, heart, blood vessels, lungs and kidneys.

Ingestion: May cause liver and kidney damage. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible

death due to respiratory failure. May cause perforation of the digestive tract. Causes digestive tract burns with immediate pain, swelling of the throat, convulsions, and possible coma. Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood. Overexposure may cause methemoglobinemia. Human fatalities have been reported from acute poisoning. May cause cardiac abnormalities.

Inhalation: Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. May be fatal if exposed to high concentrations. Aspiration may lead to pulmonary edema. May also cause pallor, loss of appetite, nausea, vomiting, diarrhea, weakness, darkened urine, headache, sweating, convulsions, cyanosis (bluish skin due to deficient oxygenation of the blood), unconsciousness, fatigue, pulmonary edema & coma. Inhalation at high concentrations may cause CNS depression and asphyxiation.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. May cause reproductive and fetal effects. Effects may be delayed. Laboratory experiments have resulted in mutagenic effects. Repeated skin contact may cause dermatitis with dark pigmentation of the skin. Animal studies have reported the development of tumors. Chronic exposures have been reported to cause death from liver and kidney

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Discard contaminated clothing in a manner which limits further exposure. SPEEDY ACTION IS CRITICAL! Destroy contaminated shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. SPEED IS ESSENTIAL. A DOCTOR MUST BE NOTIFIED AT ONCE.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask. SPEED IS ESSENTIAL, OBTAIN MEDICAL AID IMMEDIATELY.

Notes to Physician: Persons with liver or kidney disease should not be exposed to phenol for any length of time.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Containers may explode when heated. Runoff from fire control or dilution water may cause pollution. Combustible liquid and vapor.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or



alcohol-resistant foam. Use water spray to cool fire-exposed containers.

Flash Point: 79.4 deg C (174.92 deg F)

Autoignition Temperature: 715 deg C (1,319.00 deg F)

Explosion Limits, Lower: 1.8

Upper: 8.6

NFPA Rating: (estimated) Health: 4; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Do not ingest or inhale. Store protected from light. Use only in a chemical fume hood. Discard contaminated shoes. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry place. Keep container closed when not in use. Store in a tightly closed container. Keep from contact with oxidizing materials. Store protected from moisture. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Phenol	5 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route	5 ppm TWA; 19 mg/m ³ TWA 250 ppm IDLH	5 ppm TWA; 19 mg/m ³ TWA

Water	none listed	none listed	none listed
Oxalic acid, dihydrate	none listed	none listed	none listed

OSHA Vacated PELs: Phenol: 5 ppm TWA; 19 mg/m³ TWA Water: No OSHA Vacated PELs are listed for this chemical. Oxalic acid, dihydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: colorless

Odor: sweetish odor

pH: 6 aqueous solution.

Vapor Pressure: .35 mm Hg @25 deg C

Vapor Density: 3.2

Evaporation Rate: <0.01 (butyl acetate=1)

Viscosity: 1.51 cp@80 deg C

Boiling Point: 182 deg C

Freezing/Melting Point: 42.8 deg C

Decomposition Temperature: Not available.

Solubility: 6.75% in water

Specific Gravity/Density: 1.0576

Molecular Formula: C₆H₅OH

Molecular Weight: 94.1

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Light, ignition sources, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents, isocyanates, acetaldehyde, calcium hypochlorite, peroxomonosulfuric acid, nitrobenzene, sodium nitrite, aluminum chloride, peroxydisulfuric acid, 1,3-butadiene, boron trifluoride diethyl ether.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 108-95-2: SJ3325000

CAS# 7732-18-5: ZC0110000

CAS# 6153-56-6 unlisted.

LD50/LC50:

CAS# 108-95-2:

Draize test, rabbit, eye: 5 mg Severe;
Draize test, rabbit, skin: 500 mg/24H Severe;
Draize test, rabbit, skin: 100 mg Mild;
Inhalation, mouse: LC50 = 177 mg/m³;
Inhalation, mouse: LC50 = 177 mg/m³/4H;
Inhalation, rat: LC50 = 316 mg/m³;
Inhalation, rat: LC50 = 316 mg/m³/4H;
Oral, mouse: LD50 = 270 mg/kg;
Oral, rat: LD50 = 317 mg/kg;
Oral, rat: LD50 = 512 mg/kg;
Skin, rabbit: LD50 = 630 mg/kg;
Skin, rat: LD50 = 669 mg/kg;
Skin, rat: LD50 = 1500 mg/kg;

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

CAS# 6153-56-6:

Carcinogenicity:

CAS# 108-95-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 6153-56-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: The predominant acute action of a toxic dose of phenol in man appears to be to the central nervous system, leading to sudden collapse and unconsciousness.

Teratogenicity: Oral, rat: TDLo = 1200 mg/kg (female 6-15 day(s) after conception) Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus).; Oral, mouse: TDLo = 4 gm/kg (female 6-15 day(s) after conception) Specific Developmental Abnormalities - musculoskeletal system.

Reproductive Effects: Oral, rat: TDLo = 300 mg/kg (female 6-15 day(s) after conception) Fertility - post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants).

Mutagenicity: Mutation Test Systems - not otherwise specified: Human, HeLa cell = 17 mg/L.; DNA Inhibition: Human, HeLa cell = 1 mmol/L.; Mutation Test Systems - not otherwise specified: Human, Lymphocyte = 5 umol/L.; Sister Chromatid Exchange: Human, Lymphocyte = 5 umol/L.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Water flea Daphnia: EC50=12 mg/l; 48-hour; CAS# 108-95-2: Unspecified
 Water flea Daphnia: EC50=4.0 mg/l; 96-hour; CAS# 108-95-2: Unspecified
 Fish: Fathead Minnow: LC50 > 50 mg/l; 1 Hr; CAS# 108-95-2 Static @ 18-22°C
 Fish: Fathead Minnow: TLm = 41 mg/L; 48-hour; CAS# 108-95-2: Flow-through @ 15°C
 Fish: Bluegill/Sunfish: TLm = 19 / 5.7 mg/L; 96 Hr; CAS# 108-95-2: Flow-through
 If released to the environment, phenol's primary removal mechanism is biodegradation which is generally rapid (days). If phenol is released to soil, it will readily leach and biodegrade. The biodegradation in soil is generally rapid with half-lives of under 5 days even in subsurface soils.

Environmental: Phenol does not bioconcentrate in aquatic organisms. In the atmosphere, phenol occurs as a vapor and reacts with photochemically-produced hydroxyl radicals resulting in a half-life of approximately 15 hours. During the nighttime, it reacts with nitrate radicals with a resulting half-life of 12 minutes. Phenol has also been shown to be readily removed from the atmosphere by rain.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series:

CAS# 108-95-2: waste number U188.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	PHENOL SOLUTIONS	PHENOL, SOLID
Hazard Class:	6.1	6.1(9.2)
UN Number:	UN2821	UN1671
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 108-95-2 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 6153-56-6 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

CAS# 108-95-2: Effective 6/1/87, Sunset 6/1/97

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 108-95-2: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 108-95-2: 500 lb lower threshold TPQ; 10000 lb upper threshold TP Q

SARA Codes

CAS # 108-95-2: immediate, delayed, fire.

CAS # 6153-56-6: immediate, delayed.

Section 313

This material contains Phenol (CAS# 108-95-2, 89%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 108-95-2 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 108-95-2 is listed as a Hazardous Substance under the CWA. CAS# 108-95-2 is listed as a Priority Pollutant under the Clean Water Act. CAS# 108-95-2 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 108-95-2 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 6153-56-6 can be found on the following state right to know lists: Pennsylvania.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T

Risk Phrases:

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

R 34 Causes burns.

R 48/20/21/22 Harmful : danger of serious damage to health by



prolonged exposure through inhalation, in contact with skin and if swallowed.

R 68 Possible risk of irreversible effects.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 28 After contact with skin, wash immediately with...

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 108-95-2: 2

CAS# 7732-18-5: No information available.

CAS# 6153-56-6: 1

Canada - DSL/NDSL

CAS# 108-95-2 is listed on Canada's DSL List.

CAS# 7732-18-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1A, E, D2B, B3.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 108-95-2 is listed on the Canadian Ingredient Disclosure List.