

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	<p>Toxic compound, do not ingest or inhale. Avoid all contact with this material.</p> <p>Corrosive to eyes and skin on contact.</p> <p>Combustible material; avoid heat and sources of ignition.</p> <p>CARCINOGEN. MINIMIZE EXPOSURE.</p> <p>MUTAGEN. MINIMIZE EXPOSURE.</p> <p>Reproductive effector; may damage fertility or the unborn child.</p> <p>Environmental hazard.</p> <p>This material is toxic to aquatic organisms and may cause long term adverse effects to the aquatic environment.</p> <p>Readily absorbed through skin.</p> <p>Vesicant.</p> <p>Hygroscopic -- keep container tightly sealed.</p> <p>Light sensitive material.</p> <p>Air sensitive material.</p> <p>Store under argon.</p>	

Section I. Chemical Product and Company Identification

Chemical Name	Phenol		
Catalog Number	P1610	Supplier	TCI America 9211 N. Harbortgate St. Portland OR 1-800-423-8616
Synonym	Not available.		
Chemical Formula	C ₆ H ₆ O		
CAS Number	108-95-2	In case of Emergency Call	Chemtrec® (800) 424-9300 (U.S.) (703) 527-3887 (International)

Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
Phenol	108-95-2	Min. 98.0 (GC)	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen. This compound is classified as a mutagen. There is no acceptable exposure limit for a mutagen.	Rat LD ₅₀ (inhalation) 316 mg/m ³ /4H Rat LD ₅₀ (oral) 317 mg/kg Rabbit LD ₅₀ (dermal) 630 mg/kg

Section III. Hazards Identification

Acute Health Effects	<p>Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested.</p> <p>Readily absorbed through skin.</p> <p>Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.</p>
Chronic Health Effects	<p>CARCINOGENIC EFFECTS : Carcinogenic by RTECS criteria.</p> <p>MUTAGENIC EFFECTS : Not available.</p> <p>TERATOGENIC EFFECTS : Tumorigenic Effects Mouse TD (Skin) 4000 mg/kg/24 weeks intermittent Toxic Effects: Tumorigenic - Neoplastic by RTECS criteria Skin and Appendages - Tumors Mouse TDLo (Skin) 16 gm/kg/40 weeks intermittent Toxic Effects: Tumorigenic - Carcinogenic by RTECS criteria Skin and Appendages - Tumors</p> <p>DEVELOPMENTAL TOXICITY: Reproductive Effects Rat TDLo (Intraperitoneal) 600 mg/kg. Female 12-14 days of pregnancy. Toxic Effects: Effects on Embryo or Fetus - Fetotoxicity Rat TDLo (Oral) 300 mg/kg. Female 6-15 days of pregnancy. Toxic Effects: Effects on Fertility - Post implantation mortality Rat TDLo (Oral) 300 mg/kg. Female 6-15 days of pregnancy. Toxic Effects: Effects on Fertility - Post-implantation mortality. Effects on Embryo or Fetus - Fetotoxicity.</p> <p>Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.</p>

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Emergency phone number (800) 424-9300

Section IV. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Inhalation	If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve.
Ingestion	DO NOT INDUCE VOMITING. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive.

Section V. Fire and Explosion Data

Flammability	May be combustible at high temperature.	Auto-Ignition	715 °C (1319 °F)
Flash Points	79 °C (174.2 °F).	Flammable Limits	LOWER: 1.4% UPPER: 10%
Combustion Products	These products are toxic carbon oxides (CO, CO ₂).		
Fire Hazards	Not available.		
Explosion Hazards	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.		
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. Consult with local fire authorities before attempting large scale fire-fighting operations.		

Section VI. Accidental Release Measures

Spill Cleanup Instructions	Toxic material. Corrosive material. Combustible material. Carcinogenic material. Mutagenic material. Reproductive effecting material. Toxic environmentally hazardous material. Readily absorbed through skin. Vesicanting material. Hygroscopic material. Light sensitive material. Air sensitive material. Stop leak if without risk. DO NOT get water inside container. DO NOT touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition. Consult federal, state, and/or local authorities for assistance on disposal.
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Section VII. Handling and Storage

Handling and Storage Information	TOXIC. CORROSIVE. COMBUSTIBLE. CARCINOGEN. MUTAGEN. REPRODUCTIVE EFFECTER. TOXIC ENVIRONMENTAL HAZARD. READILY ABSORBED THROUGH SKIN. VESICANT. HYGROSCOPIC. LIGHT SENSITIVE. AIR SENSITIVE. STORE UNDER ARGON. Keep locked up. Keep container dry. Keep away from heat. Mechanical exhaust required. When not in use, tightly seal the container and store in a dry, cool place. Avoid excessive heat and light. DO NOT ingest. Do not breathe dust. Never add water to this product. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Always store away from incompatible compounds such as oxidizing agents, acids, alkalis (bases).
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Section VIII. Exposure Controls/Personal Protection

Engineering Controls	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection	Face shield. Lab coat. Dust respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. 
Exposure Limits	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen. This compound is classified as a mutagen. There is no acceptable exposure limit for a mutagen.

Section IX. Physical and Chemical Properties

Physical state @ 20 °C	Solid. (Crystal, powder. White, pale red.)	Solubility	Soluble in 1g/15ml water; 1 g/12 ml benzene; methanol (1 to 20); Very soluble in alcohol, chloroform, ether, glycerol, carbon disulfide, petroleum, volatile and fixed oils, and aqueous alkali hydroxides; Partially soluble in dissociated organic in general; Less soluble in parafinic hydrocarbons; Miscible with acetone.
Specific Gravity	1.07 (water=1)	Partition Coefficient	LOG P _{ow} : 1.46
Molecular Weight	94.11	Vapor Pressure	0.5 hPa (0.4 mmHg) @ 20 °C (68 °F)
Boiling Point	181 °C (357.8 °F)	Vapor Density	3.2 (Air = 1)
Melting Point	42 °C (107.6 °F)	Volatility	Not available.
Refractive Index	Not available.		

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Critical Temperature	Not available.	Odor	Characteristic. Distinct aromatic, somewhat sickening sweet and acrid odor.
Viscosity	Not available.	Taste	Not available.

Section X. Stability and Reactivity Data

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light. Air sensitive.
Incompatibilities	Reactive with strong oxidizing agents, strong acids, strong alkalis (bases).

Section XI. Toxicological Information

RTECS Number	SJ3325000
Routes of Exposure	Eye Contact. Ingestion. Inhalation. Skin contact.
Toxicity Data	Rat LD ₅₀ (inhalation) 316 mg/m ³ /4H Rat LD ₅₀ (oral) 317 mg/kg Rabbit LD ₅₀ (dermal) 630 mg/kg
Chronic Toxic Effects	CARCINOGENIC EFFECTS : Carcinogenic by RTECS criteria. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Tumorigenic Effects Mouse TD (Skin) 4000 mg/kg/24 weeks intermittent Toxic Effects: Tumorigenic - Neoplastic by RTECS criteria Skin and Appendages - Tumors Mouse TDLo (Skin) 16 gm/kg/40 weeks intermittent Toxic Effects: Tumorigenic - Carcinogenic by RTECS criteria Skin and Appendages - Tumors DEVELOPMENTAL TOXICITY: Reproductive Effects Rat TDLo (Intraperitoneal) 600 mg/kg. Female 12-14 days of pregnancy. Toxic Effects: Effects on Embryo or Fetus - Fetotoxicity Rat TDLo (Oral) 300 mg/kg. Female 6-15 days of pregnancy. Toxic Effects: Effects on Fertility - Post implantation mortality Rat TDLo (Oral) 300 mg/kg. Female 6-15 days of pregnancy. Toxic Effects: Effects on Fertility - Post-implantation mortality. Effects on Embryo or Fetus - Fetotoxicity. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
Acute Toxic Effects	Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested. Readily absorbed through skin. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	Phenol's production and use as a chemical intermediate, disinfectant and antiseptic may result in its release to the environment through various waste streams. It is also released by wood stoves, vehicle exhaust and other combustion processes. Phenol is naturally produced in decaying organic matter. If released to air, a measured vapor pressure of 0.35 mm Hg at 25 deg C indicates phenol will exist solely as a vapor in the ambient atmosphere. The measured rate constant for the vapor-phase reaction of phenol with photochemically produced hydroxyl radicals is 2.63X10 ⁻¹¹ cu cm/molecule sec at 25 deg C. This corresponds to an atmospheric half-life of 14.6 hours at an atmospheric concentration of 5X10 ⁺⁵ hydroxyl radicals per cu cm. During the nighttime, phenol reacts with nitrate radicals with a resulting half-life of 12 minutes. If released to soil, phenol is expected to have high mobility based upon Koc values that are generally below 100. Volatilization from moist soil surfaces is not expected to be an important fate process based upon a Henry's Law constant of 3.33X10 ⁻⁷ atm-cu m/mole. The pKa of phenol is 9.99, indicating that this compound will primarily exist in its un-ionized form at environmental conditions. Phenol is not expected to volatilize from dry soil surfaces based upon its vapor pressure 0.35 mm Hg at 25 deg C. Phenol's degradation in soil is completed in 2-5 days, even in subsurface soils. If released into water, phenol is expected to adsorb to suspended solids and sediment based upon the Koc values of 2900 and 3100 for fine and coarse sediment, respectively. Phenol completely mineralized in <1 day in water from 3 lakes; rates increase with increasing concns of phenol and the organic content of the water. It was completely removed in river water after 2 days at 20 deg C and after 4 days at 4 deg C. Volatilization from water surfaces is not expected to be an important fate process based upon phenol's Henry's Law constant. The BCFs reported in fish include: Goldorfe, 20; goldfish (Carassius auratus), 1.9; fish (unspecified), 17; fish (unspecified), 1.7; and 39, rainbow trout (Salmo gairdneri). The reported BCF values and the rapid elimination of phenol suggests that bioaccumulation of phenol is unlikely. Hydrolysis is not expected to be an important environmental fate process, since phenol lacks functional groups that hydrolyze under environmental conditions. Occupational exposure to phenol may occur through inhalation and dermal contact with phenol at workplaces where phenol is produced or used or via inhalation and dermal absorption of phenol-containing wastewater, emissions and disinfectants or solvents. Monitoring data indicate that the general population may be exposed to phenol via inhalation of ambient air, ingestion of food and drinking water, and dermal contact with consumer or medicinal products containing phenol. Dermal absorption of phenol may also occur from contact with decomposing organic matter than may contain phenol.

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Section XIII. Disposal Considerations

Waste Disposal	Recycle to process, if possible. Consult your local regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance.
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Section XIV. Transport Information

DOT Classification	DOT CLASS 6.1: Toxic material.
PIN Number	UN1671
Proper Shipping Name	Phenol solid
Packing Group (PG)	II
DOT Pictograms	

Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This compound is ON the EPA Toxic Substances Control Act (TSCA) inventory list.
WHMIS Classification (Canada)	CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS E: Corrosive solid. On DSL.
EINECS Number (EEC)	203-632-7
EEC Risk Statements	R23/24/25- Toxic by inhalation, in contact with skin and if swallowed. R34- Causes burns. R45- May cause cancer. R51- Toxic to aquatic organisms. R53- May cause long-term adverse effects in the aquatic environment.
Japanese Regulatory Data	ENCS no.: 3-481

Section XVI. Other Information

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Notice to Reader

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, household, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.