Section 1-Identification of Product

9720, 9722
WHMIS Classification Health: 3 Fire: 2 Stability: 1

Contact Information

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Emergency Contact: In Europe, call 112. In USA, call 911

Section 2-Composition/Information

Hazardous Ingredients (Specific)	%	CAS #	LD_{50}	LC_{50}
Phenol	~30-40%	108-95-2	Oral rat LD50: 317 mg/Kg	316 mg/m3
Chloroform	~10-20%	67-66-3	Oral rat LD50: 908 mg/kg	47702 mg/m3/4H

Section 3-Hazard Identification

Routes of Entry

Skin Contact	Harmful if absorbed through the skin. Direct skin contact may result in white, wrinkled discoloration, followed by severe burns. Phenol solutions may be absorbed through the skin rapidly to cause systemic poisoning and possible death.
Skin Absorption	Harmful if absorbed through the skin. Direct skin contact may result in white, wrinkled discoloration, followed by severe burns. Phenol solutions may be absorbed through the skin rapidly to cause systemic poisoning and possible death.
Eye Contact	Causes eye irritation and possible burns. May cause chemical conjunctivitis and corneal damage.
Inhalation	May be fatal if exposed to high concentrations. May cause severe respiratory tract irritation and possible burns. Aspiration may lead to pulmonary edema. May also cause pallor, loss of appetite, nausea, vomiting, diarrhea, weakness, darkened urine, headache, sweating, convulsions, cyanosis, unconsciousness, fatigue, pulmonary edema and coma. May cause systemic effects. Inhalation at high concentrations may cause CNS depression and asphyxiation. Acts as a relatively potent anesthetic. Irritates respiratory tract and causes central nervous system effects, including headache, drowsiness, and dizziness. Exposure to higher concentrations may result in unconsciousness and even death. May cause liver injury and blood disorders. Prolonged exposure may lead to death due to irregular heartbeat and kidney and liver disorders.
Ingestion	Harmful if swallowed. 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 systemic effects. Causes digestive tract irritation with possible burns. Causes severe burning in mouth and throat, pain in the chest and vomiting. Large quantities may cause symptoms similar to inhalation.

[Emergency Overview]

TOXIC BY INHALATION, IN CONTACT WITH SKIN AND IF SWALLOWED.

WHMIS Symbols

N.A.

[Potential Health Effects]

Phenol - Human poison by ingestion. An experimental poison by ingestion, subcutaneous, intravenous, parenteral, and intraperitoneal routes. Moderately toxic by skin contact. A severe eye and skin irritant. Questionable carcinogen with experimental carcinogenic and neoplastigenic data. Human mutation data reported. An experimental teratogen. Other experimental reproductive effects. Absorption of phenolic solutions through the skin may be very rapid, and can cause death within 30 minutes to several hours by exposure of as little as 64 square inches of skin. Lesser exposures can cause damage to the kidneys, liver, pancreas, and spleen, and edema of the lungs. Ingestion can cause corrosion of the lips, mouth, throat, esophagus, and stomach, and gangrene. Ingestion of 1.5 g has killed. Chronic

exposures can cause death from liver and kidney damage. Dermatitis resulting from contact with phenol or phenol-containing products is fairly common in industry. A common air contaminant. Combustible when exposed to heat, flame, or oxidizers. Potentially explosive reaction with aluminum chloride + nitromethane (at 110ºC/100 bar), formaldehyde, peroxydisulfuric acid, peroxymonosulfuric acid, sodium nitrite + heat. Violent reaction with aluminum chloride + nitrobenzene (at 120ºC), sodium nitrate + trifluoroacetic acid, butadiene. Can react with oxidizing materials. To fight fire, use alcohol foam, CO2, dry chemical. When heated to decomposition it emits acrid smoke and irritating fumes

Chloroform - Confirmed carcinogen with experimental carcinogenic, neoplastigenic, and tumorigenic data. A human poison by ingestion and inhalation. An experimental poison by ingestion and intravenous routes. Moderately toxic experimentally by intraperitoneal and subcutaneous routes. Human systemic effects by inhalation: hallucinations and distorted perceptions, nausea, vomiting, and other unspecified gastrointestinal effects. Human mutation data reported. Experimental teratogenic and reproductive effects. Inhalation of the concentrated vapor causes dilation of the pupils with reduced reaction to light, as well as reduced intraocular pressure (experimental). In the initial stages there is a feeling of warmth of the face and body, then an irritation of the mucous membranes, conjunctiva, and skin; followed by excitation, loss of reflexes, sensation, and consciousness. Prolonged inhalation will bring on paralysis accompanied by cardiac-respiratory failure and finally death.
Chloroform has been widely used as an anesthetic. However, due to its toxic effects, this use is being abandoned. Concentrations of 68,000–82,000 ppm in air can kill most animals in a few minutes. 14,000 ppm may cause death after an exposure of from 30 to 60 minutes. 5000–6000 ppm can be tolerated by animals for 1 hour without serious disturbances. The maximum concentration tolerated for several hours or for prolonged exposure with slight symptoms is 2000–2500 ppm. Prolonged administration as an anesthetic may lead to such serious effects as profound toxemia and damage to the liver, heart, and kidneys. Experimental prolonged but light anesthesia in dogs produces a typical hepatitis. Explosive reaction with sodium + methanol or sodium methoxide + methanol. Mixtures with sodium or potassium are impact-sensitive explosives. Reacts violently with acetone + alkali (e.g., sodium hydroxide, potassium hydroxide, or calcium hydroxide), Al, disilane, Li, Mg, methanol + alkali, nitrogen tetroxide, perchloric acid + phosphorus pentoxide, potassium-tert-butoxide, sodium methylate, NaK. Incompatible with dinitrogen tetraoxide, fluorine, metals, or triisopropylphosphine. Nonflammable. When heated to decomposition it emits toxic fumes of Cl^-

Section 4-First Aid Measures	
Skin Contact	Get medical aid. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.
Eye Contact	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed.
Inhalation	Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.
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. Get medical aid immediately.
Note to Physician:	Because kidney and liver effects may be delayed, keep victim under observation for 24 to 48 hr. Administration of fluids may help to prevent kidney failure. Obtain blood glucose, Urinalysis, liver function tests, chest x-ray, and monitor cardiac function and fluidelectrolyte status. Monitor liver and kidney function for 4 to 5 days after exposure. Disulfiram, its metabolites, and a high carbohydrate diet appear to protect somewhat against chloroform toxicity. Do not give adrenalin! Tests may show increased bilirubin, ketosis, lowered blood prothombin, and fibrogen.

Section 5-Fire Fighting Measures	
Flammable	Flammable
Means of Extinction	CO2, H2O, Foam, Dry Chemical
Flashpoint (°C) and Method	Not Tested. Phenol-79C (174F)
Upper Flammable Limit (% by volume)	Not Tested. Phenol-8.6%
Lower Flammable Limit (% by volume)	Not Tested. Phenol-1.3%
Autoignition Temperature (°C)	Not Tested. Phenol-715C (1319F)
Explosion Data – Sensitivity to Impact	Not Tested
Explosion Data – Sensitivity to Static Discharge	Not Tested
Hazardous Combustion Products	Not Tested
NFPA	Health: 3 Fire: 2 Stability: 1

Section 6-Accidental Release Measures
Leak and Spill Procedures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

Section 7-Handling and Storage	
Handling Procedures and Equipment	Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace.
Storage Requirements	Keep in a tightly closed light-resistant container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels.

Section 8-Exposure Control/Personal Protection	
Exposure Limits	
ACGIH TLV	Phenol - 5 ppm TWA; skin - potential for cutaneous absorption
	Chloroform - 10 ppm TWA
OSHA PEL	Phenol - 5 ppm TWA; 19 mg/m3 TWA
	Chloroform - 50 ppm Ceiling; 240 mg/m3 Ceiling
Other (specify)	N.A.
Engineering Controls (specific)	
General	Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.
Local Exhaust	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Other	N.A.
Personal Protective Equipment (specific)	
Gloves	Neoprene gloves
Respirator	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 a respirator's use.
Eye	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. Maintain eye wash fountain and quick-drench facilities in work area.
Footwear	Closed toe shoes
Clothing	Wear appropriate protective clothing to prevent skin exposure.
Other	Chemical fume hood, face shield

Section 9-Physical and Chemical Properties	
Physical State	Liquid
Odor and Appearance	Strong / White- off white
Odor Threshold (ppm)	Not Tested
Specific Gravity	Not Tested
Vapor Density (Air=1)	Not Tested
Vapor Pressure (mmHg)	Not Tested
Evaporation Rate	Not Tested
Boiling Point (^{o}C)	Not Tested
Freezing Point (^{o}C)	Not Tested
pH	4.5
Coefficient of Water/Oil Distribution	Not Tested
[Solubility in Water]	Not Tested

Section 10-Stability and Reactivity	
Chemical Stability	Stable

Incompatible with other substances	Aluminum chloride, nitrobenzene, peroxomonosulfuric acid, peroxydisulfuric acid, calcium hypochlorite, sodium nitrite, acetaldehyde, 1,3-butadiene, boron trifluoride diethyl ether, strong oxidizing agents, isocyanates, nitrides (e.g. potassium nitride, sodium nitride), acids, sodium + methanol, sodium methoxide + methanol, sodium, potassium, acetone + alkali, aluminum, disilane, lithium, magnesium, potassium-tert -butoxide, sodium methylate, dinitrogen tetraoxide, fluorine, metals, triisopropylphosphine, reducing agents, hydrogen trisulfide, acid anhydrides, acid chlorides.
Reactivity	Not Tested
Hazardous Decomposition Products	Hydrogen chloride, phosgene, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, chlorine.

Section 11-Toxicological Information

Acute Effects	Harmful if inhaled, swallowed, or absorbed through skin.
Chronic Effects	May cause cancer
Irritancy of Product	Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical Phenumonitis and Pulmonary Edema.
Skin Sensitization	Not Tested
Respiratory Sensitization	Not Tested

Carcinogenicity

IARC (1,2A, or 2B)	CAS# 108-95-2: IARC Group 3 - not classifiable CAS# 67-66-3:
ACGIH (A1, A2, or A3)	A4 - Not Classifiable as a Human Carcinogen A3 - Animal Carcinogen
Reproductive Toxicity	CAS# 108-95-2: 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)
Teratogenicity	CAS# 108 -95-2: 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.
Embryotoxicity	No Information
Mutagenicity	CAS# 108-95-2: 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,
Name of Synergistic Products/Effects	N.A.

Section 12-Ecological Information

Aquatic Toxicity	Water flea Daphnia: EC50=12 mg/l; 48 -hour; CAS# 108-95-2: Unspecified flea Daphnia: EC50=4.0 mg/l; 96-hour; CAS# 108-95-2: Unspecified Fathead Minnow: LC50 > 50 mg/l; 1 Hr; CAS# 108-95-2 Static @ 18-22°C Fathead Minnow: TLm = 41 mg/L; 48-hour; CAS# 108-95-2: Flow-through @ 15°C 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.

Section 13-Disposal Considerations

Waste Disposal	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.

Section 14-Transport Information

Special Shipping Information

PIN	Toxic Liquid, Organic N.O.S.
TDG	Packing Group III
[DOT]	Hazard Class 6.1 UN 2810
[IMO]	Not listed
[ICAO]	Not listed

Section 15-Regulatory Information

[WHMIS Classification]	

[OSHA]	Phenol - CAS# 108-95-2: Effective Date: 6/1/87; Sunset Date: 6/1/97
	Chloroform - CAS# 67-66-3: Effective Date: 6/1/87; Sunset Date: 6/1/97
[SARA]	Phenol - CAS# 108-95-2: 500 lb TPQ (lower threshold); 10,000 lb TPQ (upper threshold); 1000 lb EPCRA RQ
	Phenol - 108-95-2: acute, chronic, flammable.
	Phenol - This material contains Phenol (CAS# 108-95-2, 52 0%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
	Chloroform - CAS# 67-66-3: 10,000 lb TPQ; 10 lb EPCRA RQ
	Chloroform - CAS # 67-66-3: acute, chronic.
	Chloroform - This material contains Chloroform (CAS# 67-66-3, 46 0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
[TSCA]	Phenol - CAS# 108-95-2 is listed on the TSCA inventory.
	Chloroform - 67-66-3 is listed on the TSCA inventory.

Section 16-Other Information

This bulletin is for your guidance and is based upon information and tests believed to be reliable. Ambion makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages thereto. The data are offered solely for your consideration, investigation, and verification. These suggestions should not be confused with state, municipal, or insurance requirements, or with national safety codes and constitute no warranty. Any use of these data and information must be determined by the user to be in accordance with applicable federal, state, and local regulations.