Material Safety Data Sheet
Phenol, 99+%, Loose Crystals, Biochemical Grade

ACC# 01180

Section 1 - Chemical Product and Company Identification

MSDS Name: Phenol, 99+%, Loose Crystals, Biochemical Grade
Catalog Numbers: AC180780000, AC180781000, AC180785000
Synonyms: Carbolic Acid; Phenylic Acid; Hydroxybenzene; Monohydroxybenzene; Phenyl Hydroxide.
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
108-95-2	Phenol	99+%	203-632-7

Hazard Symbols: T
Risk Phrases: 34 24/25

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid. Flash Point: 79 deg C. **Danger!** Corrosive. May cause central nervous system effects. May cause liver and kidney damage. Harmful if swallowed or absorbed through the skin. May be harmful if inhaled. May cause central nervous system depression. Causes eye and skin burns. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns. This substance has caused adverse reproductive and fetal effects in animals. Air sensitive. Hygroscopic (absorbs moisture from the air).
Target Organs: Kidneys, central nervous system, liver.

Potential Health Effects

Eye: Contact with liquid or vapor causes severe burns and possible irreversible eye damage. May cause chemical conjunctivitis and corneal damage.
Skin: Harmful if absorbed through the skin. Direct skin contact results in white, wrinkled discoloration, followed by severe burns. Phenol solutions may be absorbed through the skin ra pidly to cause systemic poisoning and possible death.
Ingestion: Harmful if swallowed. May cause severe and permanent damage to the digestive tract. 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.
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 asphixiation.
Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. May cause liver and kidney damage. 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.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub 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. Wash clothing before reuse. 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. Get medical aid immediately.
Inhalation: Get medical aid immediately. 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.
Notes to Physician: Persons with liver or kidney disease should not be exposed to phenol for any length of time.
Antidote: Activated charcoal, followed by cathartic, may be preferred to ipecac induced emesis or lavage in decontamination of the GI tract and preventing systemic absorption of phenol.

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. Use water spray to keep fire-exposed containers cool. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion. Containers may explode when heated.
Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Use agent most appropriate to extinguish fire.
Flash Point: 79 deg C (174.20 deg F)
Autoignition Temperature: 605 deg C (1,121.00 deg F)
Explosion Limits, Lower:1.30 vol %
Upper: 9.50 vol %
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. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. 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. Use only in a well-ventilated area. Minimize dust generation and accumulation. 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. Avoid contact with heat, sparks and flame. Do not ingest or inhale. Store protected from light. 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. Keep container closed when not in use. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep refrigerated. (Store below 4°C/39°F.) 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 for cutaneous absorption	5 ppm TWA; 19 mg/m3 TWA 250 ppm IDLH	5 ppm TWA; 19 mg/m3 TWA

OSHA Vacated PELs: Phenol: 5 ppm TWA; 19 mg/m3 TWA
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 a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white
Odor: sharp sweet, tangy odor detectable above
pH: Not available.
Vapor Pressure: 0.36 mm Hg
Vapor Density: 3.2
Evaporation Rate:0.01 (butyl acetate=1)
Viscosity: Not available.
Boiling Point: 182 deg C @ 760.00mm Hg
Freezing/Melting Point:43 deg C
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density:1.0710g/cm3
Molecular Formula:C6H6O
Molecular Weight:94.11

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, light, ignition sources, dust generation, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents, acids, isocyanates, acetaldehyde, nitrides (e.g. potassium nitride, sodium nitride), calcium hypochlorite, peroxomonosulfuric acid, nitrobenzene, sodium nitrite, aluminum chloride, peroxydisulfuric acid, 1,3-

butadiene, boron trifluoride diethyl ether.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 108-95-2: SJ3325000
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, rat: LC50 = 316 mg/m3;
Oral, mouse: LD50 = 270 mg/kg;
Oral, rat: LD50 = 317 mg/kg;
Skin, rabbit: LD50 = 630 mg/kg;
Skin, rat: LD50 = 669 mg/kg;

Carcinogenicity:
CAS# 108-95-2:
ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: IARC Group 3 - not classifiable
Epidemiology: Administration onto the skin, mouse: TDLo = 16 gm/kg/40W-I (Tumorigenic - Carcinogenic by RTECS criteria - S kin and Appendages - tumors).
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).
Neurotoxicity: No data available.
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.
Other Studies: Standard Draize Test: Administration onto the skin (rabbit) = 500 mg/24H (Severe). Standard Draize Test: Administra tion into the eye (rabbit) = 5 mg (Severe).

Section 12 - Ecological Information

Ecotoxicity: 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.
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	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	PHENOL, SOLID				No information available.
Hazard Class:	6.1				
UN Number:	UN1671				
Packing Group:	II				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 108-95-2 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 108-95-2: Effective Date: 6/1/87; Sunset Date: 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.
SARA

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 TPQ (lower threshold); 10,000 lb TPQ (upper thre shold)
SARA Codes
CAS # 108-95-2: acute, chronic, flammable.
Section 313
This material contains Phenol (CAS# 108-95-2, 99%),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 depletors. This material does not contain any Class 2 Ozone depletors.
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. 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 34 Causes burns.
R 24/25 Toxic in contact with skin and if swallowed.

Safety Phrases:
S 1/2 Keep locked up and out of reach of children.
S 28 After contact with skin, wash immediately with...
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
Canada - DSL/NDSL
CAS# 108-95-2 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of D1A, E, D2A.
Canadian Ingredient Disclosure List
CAS# 108-95-2 is listed on the Canadian Ingredient Disclosure List.
Exposure Limits
CAS# 108-95-2: OEL-ARAB Republic of Egypt:TWA 5 ppm (19 mg/m3);Skin OEL-AUSTRALIA:TWA 5 ppm (19 mg/m3);Skin OEL-BELGIUM:TWA 5 ppm (19 mg/m3);Skin OEL-CZECHOSLOVAKIA:TWA 20 mg/m3;STEL 40 mg/m3 OEL-DENMARK: TWA 5 ppm (19 mg/m3);Skin OEL-FINLAND:TWA 5 ppm (19 mg/m3);STEL 10 ppm (38 mg/m3);Skin OEL-FRANCE:TWA 5 ppm (19 mg/m3);Skin OEL-GERMANY:TWA 5 ppm (19 mg/m3);Skin OEL-HUNGARY:TWA 4 mg/m3;STEL 8 mg/m3;Skin OEL-JAPAN:TWA 5 ppm (19 mg/m3);Skin OEL-THE NETHERLANDS:TWA 5 ppm (19 mg/m3);Skin OEL-THE PHILIPPINES:TWA 5 ppm (10 mg/m3);Skin OEL-POLAND :TWA 10 ppm OEL-RUSSIA:TWA 5 ppm;STEL 0.3 mg/m3;Skin OEL-SWEDEN:TWA 1 ppm (4 mg/m3);STEL 2 ppm (8 mg/m3);Skin OEL-SWITZERLAND:TWA 5 ppm (19 mg/m3);STEL 10 ppm (38 mg/m3);Skin OEL-THAILAND:TWA 5 ppm (19 mg/m3) OEL-TURKEY:TWA 5 ppm (19 mg/m3);Skin OEL-UNITED KINGDOM:TWA 5 ppm (19 mg/m3);STEL 10 ppm;Skin OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Section 16 - Additional Information

MSDS Creation Date: 7/15/1999
Revision #3 Date: 3/18/2003