

**DAKOTA GASIFICATION COMPANY**

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 Beulah, ND 58523-9400
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MATERIAL SAFETY DATA SHEET

RESPONSIBLE CARE
 OUR COMMITMENT TO SUSTAINABILITY

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFIER: **Cresylic Acid - Dephenolized**

GENERAL USE: Intermediate used in the production of resins, dyes, fragrances, deodorizers, insecticides, etc.

PRODUCT DESCRIPTION: A brownish colored liquid with a phenol, medicinal odor.

MANUFACTURER:

Dakota Gasification Company
 420 County Road 26
 Beulah, North Dakota 58523-9400
 (701) 873-6677

EMERGENCY TELEPHONE NUMBERS:

Dakota Gasification (701) 873-6600
 CHEMTREC (800) 424-9300

2. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENTS</u>	<u>WT. %</u>	<u>CAS Registry #</u>
Meta-cresol	29 - 35	108-39-4
Para-cresol	17 - 23	106-44-5
Ortho-cresol	18 - 22	95-48-7
Xylenols	10 - 12	1300-71-6
Ethylphenols	7 - 9	90-00-6
C ₉ Phenolics	0.9	Not Noted
Guaiacol	2 - 5	90-05-1
Naphthalene	0.3 - 1.0	91-20-3
Catechol	0.01 – 1.0	120-80-9
Phenol	0.01 - 2.50	108-95-2

OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200):**EXPOSURE LIMITS 8 hrs. TWA (ppm)**

	<u>OSHA PEL</u>	<u>ACGIH TLV</u>
Meta-cresol	5 ppm	5 ppm
Para-cresol	5 ppm	5 ppm
Ortho-cresol	5 ppm	5 ppm

Xylenols	Not Established	Not Established
Ethylphenols	Not Established	Not Established
C ₉ Phenolics	Not Established	Not Established
Guaiacol	Not Established	Not Established
Naphthalene	10 ppm	10 ppm
Catechol	Not Established	5 ppm
Phenol	5 ppm	5 ppm

3. HAZARDS IDENTIFICATION/EMERGENCY OVERVIEW:

Routes of Entry: Absorption, inhalation, ingestion, skin contact, and eye contact.

Effects of Acute Exposure: This material has a strong corrosive effect on the skin and eyes. The material can rapidly absorb through the skin and may cause death. Nausea, headache, respiratory failure, muscular weakness, gastroenteric disturbances, severe depression, collapse, and death. Minor to severe chemical burns. Redness or blisters to dermatitis. Although the effects are primarily on the central nervous system, edema of the lungs and injury of the kidneys, liver, pancreas, and spleen may occur. **DANGER ! ! !** Rapid DEATH may occur from gross contamination of the body.

Effects of Chronic Exposure: Organs affected by long term exposure may include the respiratory system, central nervous system, skin, eyes, lungs, kidneys, and liver. Chronic exposure may cause gastrointestinal disturbances (vomiting, anorexia), nervous disorders (headache, dizziness), dermatitis, or pigmentary disorder. Serious and sometimes fatal systemic injury can result from chronic exposure.

Odor character/threshold: Has a sweet, medicinal, irritating odor.

Odor Threshold: 0.00060 ppm.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: This material has a strong corrosive effect on the eyes. Eye irritation has been noted following brief exposures to concentrated vapors.

SKIN CONTACT: This material has a strong corrosive effect on the skin. Death has occurred from 64 sq. in. of skin exposure. Burns will result from skin contact. Even dilute solutions may cause severe burns if contact is prolonged. Systemic toxicity can result from skin or eye exposures.

INHALATION: Edema of the lungs, and respiratory failure. Ingestion can be fatal. Will act as a respiratory irritant when inhaled as a concentrated aerosol. Levels causing irritation have not been reliably documented. Exposure to concentrations of 1.5 ppm may cause mucosal irritation symptoms including dryness, nasal constriction, and throat irritation.

INGESTION: Gastroenteric disturbances. Ingestion can be fatal.

4. FIRST AID MEASURES

EYES: Remove the victim from the source of contamination and take him to the nearest eyewash, shower, or other source of clean water. Immediately

but gently brush, blot, or wipe away any liquid or powdered chemical remaining on the face, being careful not to get it on your skin. Gently rinse the affected eye(s) with clean, lukewarm water for at least 15 minutes. Have the victim lie or sit down and tilt his head back. Hold the eyelid(s) open and pour water slowly over the eyeball(s) at the inner corners, letting the water run out of the outer corners. The victim may be in great pain and want to keep his eyes closed but you must rinse the chemical out of his eye(s) in order to prevent permanent damage. Ask the victim to look up, down and side to side as you rinse in order to better reach all parts of the eye(s). Seek medical attention immediately.

SKIN: Rapid skin decontamination is critical. Skin exposure of 64 sq. in. has caused fatality. Skin contact can be life threatening. The victim may not be aware of initial skin contact because of local anaesthetic effect of phenol. Remove clothing, shoes, socks, and jewelry from the affected areas as quickly as possible, cutting them off if necessary. **Be Careful** not to get any chemical on your skin or clothing. Blot excess chemical from the skin very gently. In case of extensive splashing, wash the victim down under a shower under cold or luke-warm water while protecting the victim's eyes. Rinse the skin area for at least 15 minutes. Keep victim quiet and maintain normal body temperature. If burns develop, such as inflammation or blisters, apply a dry sterile dressing or use a clean dry cloth. Elevate the affected area above the level of the victim's heart if possible. If the victim is in pain, immerse the painful area in cold water or apply cold wet dressings. **DO NOT** break open blisters or remove skin. If clothing is stuck to skin after flushing with water, do not remove it. **DO NOT** use hot water. Seek medical attention immediately.

INHALATION: Remove victim to fresh air at once. Initiate artificial respiration and supply oxygen if needed. Keep victim warm and at rest. Seek medical attention. If patient is conscious, the irritation of the throat may be relieved by water in the mouth. Seek medical attention immediately.

INGESTION: A conscious victim should immediately drink 4 to 8 ounces of water, and then a slurry of activated charcoal to reduce the concentration of the chemical. Have him rinse his mouth several times with cold water and spit out. Do not induce vomiting. Do not give sodium bicarbonate or carbonated drinks. Keep victim warm and quiet. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

FLASH POINT: Approximately 187°F (Tagliabue/Tag Closed Tester)

AUTO-IGNITION TEMPERATURE: Approximately 1038°F

FIRE AND EXPLOSION HAZARDS: Low hazard under normal conditions. Material is combustible.

UPPER EXPLOSIVE / FIRE LIMITS: Not Established

LOWER EXPLOSIVE / FIRE LIMITS: 1% to 1.4%

EXTINGUISHING MEDIA: Water fog, alcohol foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES: Fire fighters should wear NIOSH approved self-contained breathing apparatus. Cool exposed containers with water. Stop discharge at source providing this can be safely done. Stay upwind and use water spray to knock down vapor. Confine run off water by diking the area.

6. ACCIDENTAL RELEASE MEASURES

SPILL OR LEAK PROCEDURES: Keep public away. Then flush area with large quantities of water into an appropriate chemical drain. Employees not wearing protective equipment and clothing should be restricted from areas of spills or leaks until cleanup has been completed. Remove all ignition sources. Ventilate area of spill or leak. Small quantities of liquid can be absorbed onto paper towels and placed in an appropriate container. Place in a lab hood for evaporation. Larger quantities of liquids may be absorbed in vermiculite, dry sand, earth or similar material and placed into a removable head steel drum. Do not wash material into sewers or confined space because of the possibility of an explosion.

WASTE DISPOSAL METHOD: Spills or releases should be reported, if required, to the local, state, and federal regulatory agencies. The materials resulting from clean-up operations of a spill may be hazardous and therefore subject to specific regulations.

Package, store, transport, and dispose of all clean-up materials and any contaminated equipment in accordance with all applicable local, state, and federal regulations. Shipments of waste materials may be subject to manifesting requirements per applicable regulations. Appropriate disposal will depend on the nature of the waste and should be performed by competent personnel.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE: Ambient

SHELF LIFE: Indefinite

SPECIAL SENSITIVITY: None known

HANDLING/STORAGE PRECAUTIONS: Store in steel, stainless, or nickel tanks. Cresylic acids react with nitrile rubber. Do not use nitrile materials for hoses, gaskets, etc. Liquid cresol will attack some forms of plastic and coatings. Keep containers closed and dry. Keep away from sparks and open flame.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

RECOMMENDED WORK/HYGIENE Wash hands before eating and smoking. Do Not store food in work areas. DANGER !!! Avoid skin and eye contact. Avoid

PROCEDURES:	exposure.
EYE PROTECTION REQUIREMENTS:	Chemical splash goggles or face shield that are in compliance with OSHA Regulations are advised.
HAND PROTECTION REQUIREMENTS:	Rubber gloves (PVC) or approved impervious materials.
PROTECTIVE CLOTHING REQUIREMENTS:	PVC material or other material impervious to cresylic acids.
RESPIRATORY REQUIREMENTS:	Chemical cartridge - organic vapor dust mist, supplied air, or self-contained breathing air. Upper limit: 23 ppm. Supplied air continuous flow or power air purifying with organic vapor cartridge dust mist or SCBA. Upper limit: 57 ppm. Chemical cartridge organic vapor high efficiency filter, full face or SCBA, or supplied air. Upper limit: 115 ppm. Because of its odor properties, cresylic acid is treated as a chemical with adequate warning properties.
WASH REQUIREMENTS:	Wash hands, forearms, and faces prior to smoking, eating, and using toilet facilities. Wash off material immediately.
VENTILATION REQUIREMENTS:	Local; General; Maintain concentrations below the OSHA PEL's.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Dark brown liquid.
ODOR:	Phenolic, medicinal odor; Odor Threshold: 0.00060 ppm
PHYSICAL STATE:	Liquid
pH:	Not applicable; Behaves like a weak acid
VAPOR PRESSURE:	1 mm Hg at 100°F
VAPOR DENSITY:	3.7 (based on Cresols) (air = 1)
MELTING POINT:	10°F
BOILING POINT:	380°F
SPECIFIC GRAVITY:	1.04 (water = 1)
EVAPORATION RATE:	0.011 - (Butyl acetate = 1)
PERCENT VOLATILES:	Close to 100 % (volume)
BULK DENSITY:	8.67 lb./gal
SOLUBILITY IN WATER:	20 g/kg 68°F (Cresols)
SOLVENT SOLUBILITY:	Miscible with most Hydrocarbons.
MOLECULAR WEIGHT:	108.1 (Cresols o-, m-, p-)

CHEMICAL FORMULA: Mixture

CHEMICAL FAMILY: Phenolics

10. STABILITY AND REACTIVITY

INSTABILITY CONDITIONS: Reacts with oxidizing materials.

INCOMPATIBILITIES: Violent reactions can occur from contact with nitric acid, oleum, chlorosulfonic acid, and calcium hypochlorite.

DECOMPOSITION: Conditions of fire, explosion, and chemical reactions can cause the release of toxic vapors or gases.

HAZARDOUS
POLYMERIZATION: Will NOT occur.

11. TOXICOLOGICAL INFORMATION

ROUTES OF ENTRY: Ingestion, Absorption. Most of the cresols that enter the body are quickly changed to other substances and leave the body in the urine within one day. No biomarkers of exposure to cresols have been identified.

EFFECTS OF
ACUTE EXPOSURE: This material has a strong corrosive effect on the skin and eyes. The material can rapidly absorb through the skin and may cause death.

SYMPTOMS: Nausea, headache, respiratory failure, muscular weakness, gastroenteric disturbances, severe depression, collapse, and death. Minor to severe chemical burns. Redness or blisters to dermatitis.

EYE EFFECTS: Cresols and phenols are classified as severe eye irritants. Eye LC₅₀: o-cresol eye-rbt 105 mg; p-cresol eye-rbt 103 mg; m-cresol eye-rbt 103 mg; phenol eye-rbt 5 mg

SKIN EFFECTS: Cresols and phenol are moderately toxic by skin contact and are classified as severe skin irritants. Dermal LD₅₀: o-cresol skn-rat LD₅₀ 620 mg/kg; p-cresol skn-rat LD₅₀ 750 mg/kg; m-cresol skn-rat 1100 mg/kg; phenol skn-rat LD₅₀ 669 mg/kg

TOXICOLOGICAL INFORMATION (Continued):

ACUTE ORAL
EFFECTS: Cresols and phenols classified as a poison by ingestion and skin contact. Oral LD₅₀: o-cresol orl-rat LD₅₀ 121 mg/kg; p-cresol orl-rat LD₅₀ 207 mg/kg; m-cresol orl-rat LD₅₀ 242 mg/kg; phenol orl-rat LD₅₀ 340 mg/kg

CHRONIC EFFECTS/
CARCINOGENICITY: This agent is not considered a carcinogen by NTP, IARC, or OSHA. No long-term exposure data are available for humans. No immunological effects have been reported. No developmental effects have been reported in humans. No reproductive effects have been reported in humans. No biomarkers of effects caused by cresols have been identified in humans. Prolonged exposure would be most likely to occur by oral or inhalation routes.

ORGANS Affected by: Respiratory system, central nervous system, skin, eyes, lungs, kidneys, and liver.
LONG-TERM EXPOSURE:

12. ECOLOGICAL INFORMATION

Cresols degrade rapidly in the environment and concentrations in water, even in worst case conditions, would not approach the levels that would pose a chronic aquatic toxicity hazard. Their half-life is 70 days or less.

For benthic crustaceans concentrations below 0.525-0.70 mg cresols/liter of water were not acutely toxic. The 24hr - LC₅₀ values for fish are 15-30, 21-25, and 14-21 mg/liter. Of the three isomers, m-cresol appears to be the least toxic to fish.

The vapor pressure of the isomeric cresols suggests that these compounds will evaporate slowly. The relatively high water solubility of the cresol isomers indicates that wet deposition may remove them from the atmosphere. This is confirmed by the detection of cresols in rainwater.

The short atmospheric residence time expected for the cresols suggests that cresols will not be transported long distances from their initial point of release.

All cresol isomers appear to be rapidly removed from environmental media.

13. DISPOSAL CONSIDERATIONS

Containers of this material may be hazardous when emptied, since emptied containers retain product residues (vapors and liquid). Do not cut, puncture, or weld on or near the container. Do not reuse "empty" containers without first commercially cleaning, triple rinsing, or equivalent.

Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14. TRANSPORTATION INFORMATION

D.O.T. SHIPPING NAME: Cresylic Acid
D.O.T. HAZARD CLASS: 6.1(8)
U.N. NUMBER: UN 2022
D.O.T. PLACARD: Toxic, Corrosive
D.O.T. LABEL CODE: Toxic, Corrosive
PACKAGING: Packing Group II
CLASSIFICATION:

15. REGULATORY REQUIREMENTS

EPA DETERMINATIONS

CERCLA, 40 CFR 302

This product contains the following hazardous substance which when released in quantities equal to or exceeding the Reportable Quantity, triggers National Response Center notification requirements.

HAZARDOUS SUBSTANCE	REPORTABLE QUANTITY	PRODUCT SPILL QUANTITIES to Reach RQ
Meta-Cresol	100 pounds	34 gallons

Para-Cresol	100 pounds	52 gallons
Ortho-Cresol	100 pounds	53 gallons
Xylenols	1000 pounds	960 gallons
Naphthalene	100 pounds	1188 gallons
Catechol	100 pounds	2377 gallons
Phenol	1000 pounds	4754 gallons
Cresol Mixture (all isomers)	100 pounds	16.7 gallons
Cresylic Acid	100 pounds	11.5 gallons

**SUPERFUND AMENDMENTS and REAUTHORIZATION ACT OF 1986,
TITLE III - SECTIONS 302, 304, 311, 312, 313**

SECTION 302/304 - Extremely Hazardous Substances (40 CFR 355)

The material contains extremely hazardous substances at greater than 1.0% concentrations:

Ortho-cresol

Phenol

**SECTION 311/312 - MSDS and Chemical Inventory Reporting Requirements
(40 CFR 370)**

The material should be reported under the following EPA Hazard Categories.

Yes	Immediate (Acute Health Hazard)
Yes	Delayed (Chronic Health Hazard)
Yes	Fire
	Sudden Release of Pressure
	Reactive

SECTION 313 - List of Toxic Chemicals (40 CFR 372)

The material contains the following chemicals at a level of 1.0% or greater (0.1% for carcinogens) on the list of Toxic Chemicals and is subject to toxic chemical release reporting requirements.

Toxic Chemicals: Meta-Cresol
Para-Cresol
Ortho-Cresol
Naphthalene

REGULATORY REQUIREMENTS (Continued):

Catechol
Phenol

Toxic Substances Control Act (TSCA) (40 CFR 710)

The material is a mixture as defined by TSCA. The chemical ingredients in this material are in Section (b) Chemical Substance Inventory (40 CFR 710) and/or are otherwise in compliance with TSCA. Phenol is currently under an enforceable consent decree and requires export notifications under TSCA 12(b).

LIABILITY DISCLAIMER

The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct since it was obtained from sources we believe are reliable. However no representation, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications, hazards connected with the use of the material, or the results to be obtained from the use thereof. User assumes all risks and liability of any use, processing or handling of any material, variations in methods, conditions and equipment used to store, handle, or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at his sole discretion.

Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe work place to examine all aspects of its operation and to determine if or where precautions, in addition to those described herein, are required.