

Qualitative risk assessment

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Qualitative Risk Analysis

The following areas are covered under Qualitative Risk Analysis.

1.1 Qualitative risk assessment - Major chemicals handled

1.1.1 Caustic lye

MATERIAL SAFETY DATA SHEET

SODIUM HYDROXIDE LIQUID 48%

SECTION 1 CHEMICAL PRODUCT

PRODUCT IDENTIFIER: **SODIUM HYDROXIDE, LIQUID (L-NaOH)**

RECOMMENDED USAGE: **Neutralizing agent, industrial cleaner, pulping and bleaching, catalyst**

SECTION 2 HAZARDS IDENTIFICATION

Hazard Statements

DANGER!

EXTREMELY CORROSIVE

Fatal if inhaled. Avoid to be swallowed. Causes severe skin burns and eye damage.

Can cause blindness, permanent scarring and death. Toxic if swallowed and in contact with skin Suspected of damaging the unborn child. Suspected of causing genetic defects.

May cause damage to cardiovascular, respiratory, nervous, and gastrointestinal systems and liver and blood through prolonged or repeated exposure. Harmful to aquatic life.

Precautionary Statements

Do not breathe mist/vapors.

Keep container tightly closed.

Wear protective gloves and eye/face protection.

Store container tightly closed in cool/ well-ventilated

place. Wash thoroughly after handling.

SECTION 3 COMPOSITION, INFORMATION ON INGREDIENTS

CHEMICAL IDENTITY: **SODIUM HYDROXIDE, LIQUID**

TRADE NAMES/SYNONYMS: **CAUSTIC SODA; SODA LYE; LYE; LIQUID; SODIUM HYDRATE; SODIUM HYDROXIDE (NaOH); LIQUID**

CAS NUMBER: **1310-73-2**

MINIMUM PERCENTAGE: 48%

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing and shoes before reuse. Destroy contaminated shoes.

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If swallowed, drink plenty of water, do NOT induce vomiting. Get immediate medical attention.

SECTION 5 FIRE FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA: regular dry chemical, carbon dioxide, water, regular foam Large fires: Use regular foam or flood with fine water spray. **FIRE AND EXPLOSION HAZARDS:** Negligible fire hazard. **FIRE FIGHTING:** Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks.

SECTION 6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT & EMERGENCY PROCEDURES:

- **ENVIRONMENT PRECAUTION:**

SOIL RELEASE: Dig holding area such as lagoon, pond or pit for containment. Cover with plastic sheet or tarp to minimize spreading and protect from contact with water.

WATER RELEASE: Neutralize.

- **METHODS & MATERIALS FOR CONTAINMENT & CLEANING UP**

Do not touch spilled material. Stop leak if possible without personal risk.

Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal.

Small dry spills: Move containers away from spill to a safe area.

Large spills: Dike for later disposal. Keep unnecessary people away, isolate hazard area and deny entry.

SECTION 7 HANDLING AND STORAGE

- **PRECAUTIONS FOR SAFE HANDLING:**

Use smallest possible amounts in designated areas with adequate ventilation. Keep containers closed when not in use. Empty containers may contain hazardous residues. Transfer solids using tools or equipment, which are corrosion - resistant. Cautiously, transfer into sturdy containers made of compatible materials. Never return contaminated material to its original container. Considerable heat is generated when diluted with water. Proper handling procedures must be followed to prevent vigorous boiling, splattering or violent eruption of the diluted solution. Never add water to caustic. **ALWAYS ADD CAUSTIC TO WATER** and provide agitation. When mixing with water, stir small amounts in slowly. Use cold water to prevent excessive heat generation. In general, keep solid sodium hydroxide away from water. Post "DO NOT USE WATER" signs in area of use to prevent accidental contact - **PRECAUTIONS FOR SAFE STORAGE** (including any incompatibilities): Store in a cool, dry, well-ventilated area. This material absorbs water. Keep containers tightly closed when not in use and when empty. Protect from damage. Store away from incompatible materials such as strong acids, nitroaromatic, nitroparaffinic or

organohalogen compounds. Use corrosion-resistant structural materials and lighting and ventilation systems in the storage area. Containers made of nickel alloys are preferred. Steel containers are acceptable if temperatures are not elevated. Nickel is the preferred metal for handling this product. Plastics or plastic-lined steel, or FRP tanks of derakane vinyl ester resin may be suitable. If outdoor storage of pearl caustic is unavailable, the pallets should be protected against extremes of weather. Do not expose sealed containers to temperatures above 40°C (104°F)

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

CONTROL PARAMETERS:

OCCUPATIONAL EXPOSURE LIMIT or BIOLOGICAL LIMIT VALUE:

2 mg/m³ OSHA TWA

2 mg/m³ ACGIH ceiling

2 mg/m³ NIOSH recommended ceiling

APPROPRIATE ENGINEERING CONTROLS:

Local exhaust ventilation should be applied wherever there is an incidence of point source emissions or dispersion of regulated contaminants in the work area. Ventilation control of the contaminant as close to its point of generation is both the most economical and safest method to minimize personnel exposure to airborne contaminants. The most effective measures are the total enclosure of processes and the mechanization of handling procedures to prevent all personal contact. **VENTILATION:** Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Maintain eye wash fountain and quick-drench facilities in work area. Detailed requirements for personal protective equipment should be established on a site-specific basis. **EYE PROTECTION:** Wear full face-shield and chemical safety goggles when there is potential for contact. **Skin Protection:** Wear appropriate personal protective clothing to prevent skin contact. Chemical protective clothing composed of natural rubber, neoprene, nitrile, or styrene/butadiene (SBR)-coated fabric is highly recommended, having break through times greater than one hour. Butyl rubber, polyethylene, chlorinated polyurethane, or polyvinyl alcohol may be used but data suggests breakthrough times of approximately an hour or more.

RESPIRATORY PROTECTION:

Up To 10 mg/m³ : Supplied Air Respirator (SAR) operated in a continuous-flow mode, eye protection needed; or full-facepiece respirator with high-efficiency particulate filter(s); or powered air-purifying respirator with dust and mist filter(s), eye protection needed; or full-facepiece Self-Contained Breathing Apparatus (SCBA); or fullfacepiece SAR. Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Positive pressure, fullfacepiece SAR; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SAR. **ESCAPE:** Full-facepiece respirator with high-efficiency particulate filter(s); or escape-type SCBA

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

PHYSICAL STATE: LIQUID

COLOR: Colorless

CHANGE IN APPEARANCE: hygroscopic

ODOR: odorless
ODOR THRESHOLD: Not available
MOLECULAR FORMULA: Na-O-H
MOLECULAR WEIGHT: 40.00
PH: 14 (5% solution)
MELTING POINT: 604 F (318 C)
BOILING POINT: 2534 F (1390 C)
VAPOR PRESSURE: 100 mmHg @ 1111 C
VAPOR DENSITY: Not applicable
RELATIVE GRAVITY (water=1): 2.130
SOLUBILITY IN WATER: VERY soluble (111 g/100 mL at 20 ° C(68°F))
SOLVENT SOLUBILITY: Soluble: alcohol, glycerol
Insoluble: acetone, ether

SECTION 10 STABILITY AND REACTIVITY

- CHEMICAL STABILITY: Stable at room temperature. Rapidly absorbs carbon dioxide from the air, forming sodium carbonate. Slowly absorbs moisture from the air
- POSSIBILITY OF HAZARDOUS REACTIONS:
REACTIVITY: May react with evolution of heat on contact with water.
- CONDITIONS TO AVOID: Water, moisture, and air. Dangerous gases may accumulate in confined spaces.
May ignite or explode on contact with combustible materials.
- INCOMPATIBILITIES: combustible materials, acids, halo carbons, metals, halogens, oxidizing materials, peroxides, metal salts
- HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition ; SODIUM OXIDE
POLYMERIZATION: Will not polymerize. However, it can induce hazardous polymerization of acetaldehyde, acrolein, and acrylonitrile.

1.1.2 Maleic Anhydride

Maleic anhydride MSDS

Section 1: Chemical Product and Company Identification

Product Name: Maleic anhydride

CAS#: 108-31-6

Synonym: Toxilic anhydride

Chemical Name: 2,5-Furandione

Chemical Formula: C₄H₂O₃

Name CAS # % by Weight Maleic anhydride 108-31-6 100

Toxicological Data on Ingredients: Maleic anhydride: ORAL (LD50): Acute: 481 mg/kg [Rat.]. DERMAL (LD50): Acute: 2620 mg/kg [Rabbit.].

Section 3: Hazards Identification

Potential Acute Health Effects:

Very hazardous in case of ingestion. Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of inhalation. Corrosive to eyes and skin. The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death.

Potential Chronic Health Effects:

Very hazardous in case of ingestion. Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of inhalation. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage. 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.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact: If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical got on the victim's exposed skin, such as the hands : Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cold water may be used. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:

Do not induce vomiting. 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. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 476.67°C (890°F)

Flash Points: CLOSED CUP: 103.33°C (218°F).

Flammable Limits: LOWER: 1.4% UPPER: 7.1%

Products of Combustion: These products are carbon oxides (CO, CO₂).

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:

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.

Special Remarks on Fire Hazards:

Combustible when exposed to heat or flame. Material in powder form, capable of creating a dust explosion. When heated to decomposition it emits acrid smoke and irritating fumes.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill: Corrosive solid. 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 ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions: Keep container dry. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Never add water to this product. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, acids, moisture.

Storage: Keep container dry. Keep in a cool place. Ground all equipment containing material. Corrosive materials should be stored in a separate safety storage cabinet or room.

Section 8: 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: Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

TWA: 0.25 (ppm) from ACGIH (TLV) TWA: 1 (mg/m³) from ACGIH Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Crystals solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 98.06 g/mole

Color: White.

pH (1% soln/water): 7 [Neutral.]

Boiling Point: 202°C (395.6°F)

Melting Point: 52.8°C (127°F)

Critical Temperature: Not available.

Specific Gravity: 1.48 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: 3.4 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:

Soluble in cold water, hot water. Very slightly soluble in methanol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances:

Reactive with oxidizing agents, reducing agents, acids, moisture. Slightly reactive to reactive with metals, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: May decompose on exposure to moist air or water.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:

Acute oral toxicity (LD50): 481 mg/kg [Rat.]. Acute dermal toxicity (LD50): 2620 mg/kg [Rabbit.].

Chronic Effects on Humans: The substance is toxic to lungs, mucous membranes.

Other Toxic Effects on Humans: Very hazardous in case of ingestion. Hazardous in case of skin contact (irritant, permeator), of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Exposure will cause asthma, dermatitis and pulmonary oedema; effects may be delayed. Tumorigen.

Special Remarks on other Toxic Effects on Humans: Sternutator.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

WHMIS (Canada):

CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2A: Material causing other toxic effects

(VERY TOXIC). CLASS E: Corrosive solid.

DSCL (EEC): R36/38- Irritating to eyes and skin.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 1

Reactivity: 2

Personal Protection: j

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 1

Reactivity: 1

Specific hazard:

Protective Equipment:

Gloves. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

1.1.3 Ortho Xylene

Material Safety Data Sheet O -Xylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: o-Xylene

CAS#: 95-47-6

Synonym: 1,2-Dimethylbenzene

Chemical Name: o-Xylene

Chemical Formula: C₆H₄(CH₃)₂

Section 2: Composition and Information on Ingredients

Composition: Name CAS # % by Weight {o-Xylene 95-47-6 100

Toxicological Data on Ingredients: o-Xylene LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC.

MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Classified POSSIBLE for human. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/male [POSSIBLE]. The substance may be toxic to kidneys, liver, upper respiratory tract, skin, eyes, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Get medical attention.

Skin Contact: In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 463°C (865.4°F)

Flash Points: CLOSED CUP: 17°C (62.6°F).

Flammable Limits: LOWER: 0.9% UPPER: 6.7%

Products of Combustion: These products are carbon oxides (CO, CO₂).

Fire Hazards in Presence of Various Substances: Highly flammable in presence of open flames and sparks, of heat.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Slightly explosive in presence of open flames and sparks, of heat.

Fire Fighting Media and Instructions:

Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog.

Special Remarks on Fire Hazards:

Vapors are heavier than air and may travel considerable distance to source of ignition and flash back. When heated to decomposition it emits acrid smoke and irritating fumes.

Special Remarks on Explosion Hazards:

Explosive in the form of vapor when exposed to heat or flame. Vapors may form explosive mixtures with air. Containers may explode when heated. Runoff to sewer may create fire or explosion hazard

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill: Toxic flammable liquid, insoluble or very slightly soluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions: Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids.

Storage: Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: TWA: 434 STEL: 651 (mg/m³) from ACGIH (TLV) [United States]
TWA: 100 STEL: 150 (ppm) from ACGIH (TLV) [United States] STEL: 150 (ppm) from NIOSH STEL: 655 (mg/m³) from NIOSH Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Mobile, nonpolar liquid.)

Odor: Aromatic. Sweetish.

Taste: Not available.

Molecular Weight: 106.17 g/mole

Color: Colorless.

pH (1% soln/water): Not applicable.

Boiling Point: 144.4°C (291.9°F)

Melting Point: -25°C (-13°F)

Critical Temperature: 359°C (678.2°F)

Specific Gravity: 0.88 (Water = 1)

Vapor Pressure: 0.9 kPa (@ 20°C)

Vapor Density: 3.7 (Air = 1)

Odor Threshold: 0.05 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.1

Dispersion Properties: Dispersed in diethyl ether. Is not dispersed in cold water, hot water. See solubility in diethyl ether, acetone.

Solubility: Soluble in diethyl ether, acetone. Insoluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Conditions of Instability: Heat, ignition sources, flames, incompatible materials.

Incompatibility with various substances: Reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:

Photochemically reactive. Incompatible with strong oxidizers (e.g. chlorine, bromine, fluorine), and strong acids (e.g. nitric acid, acetic acid).

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals: Lowest Published Lethal Dose - Inhalation (LCL): 6125 ppm 12 hours [Rat]; 6125 ppm 12 hours [Human] Lowest Published Lethal Dose - Oral: 5000 mg/kg [Rat]

Chronic Effects on Humans:

CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC.

TERATOGENIC EFFECTS: Classified POSSIBLE for human. **DEVELOPMENTAL TOXICITY:** Classified Reproductive system/ toxin/male [POSSIBLE]. May cause damage to the following organs: kidneys, liver, upper respiratory tract, skin, eyes, central nervous system (CNS).

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

Special Remarks on Chronic Effects on Humans:

May cause adverse reproductive effects (male) and birth defects based on animal data. 0347 Animal: embryotoxic, foetotoxic, passes through the placental barrier. 0900 Detected in maternal milk in human. Narcotic effect; may cause nervous system disturbances.

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects Skin: May cause skin irritation. May be absorbed through skin i harmful amounts. Eyes: Causes severe eye irritation. Inhalation: Causes respiratory tract and mucous membranes irritation. May affect sense organs, behavior (Central Nervous system) which may result in dizziness, general weakness, central nervous system depression, confusion, ataxia, disorientation, lethargy, drowsiness, headaches. May also affect respiration, cardiovascular system, liver, blood, and digestive system (nausea, vomiting) Ingestion: Harmful if swallowed. Causes digestive tract irritation with nausea, vomiting and diarrhea. May also affect metabolism, liver, and urinary system, and central nervous system (excitement followed by headache, dizziness, drowsiness and nausea). **Chronic Potential Health Effects:** Skin: Prolonged or repeated contact may cause defatting of skin and dermatitis. Eyes: Prolonged or repeated exposure may cause conjunctivitis or permanent eye damage. Inhalation: Chronic inhalation may cause effects similar to those of acute inhalation.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Xylene UNNA: 1307 PG: III

Special Provisions for Transport: Not available.

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.