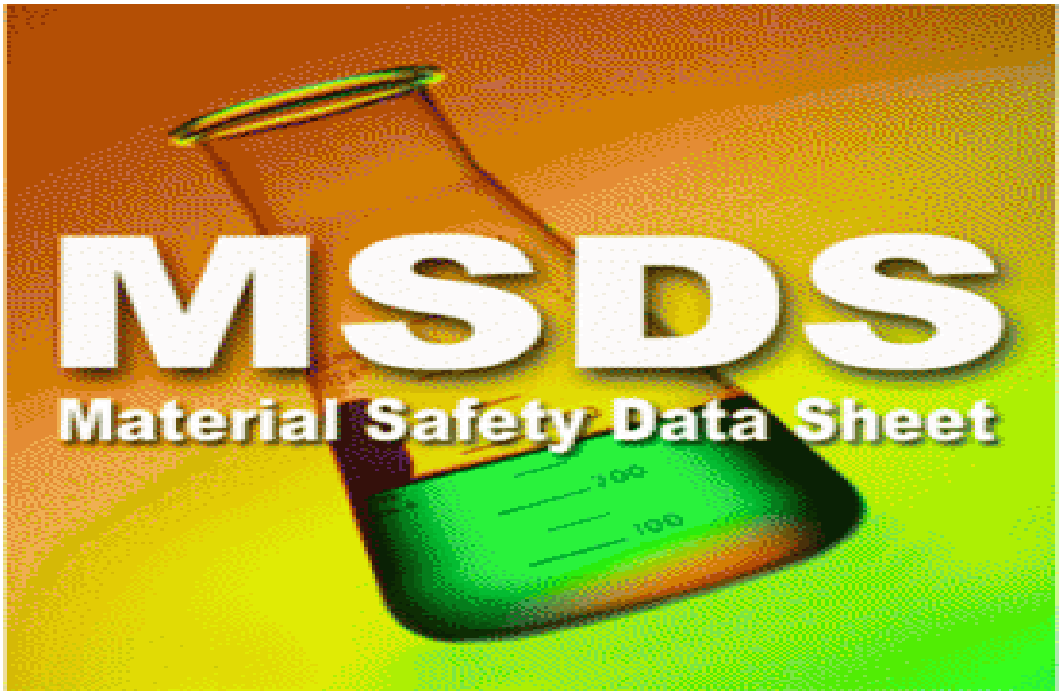
MATERIAL SAFETY AND DATA SHEET [MSDS]



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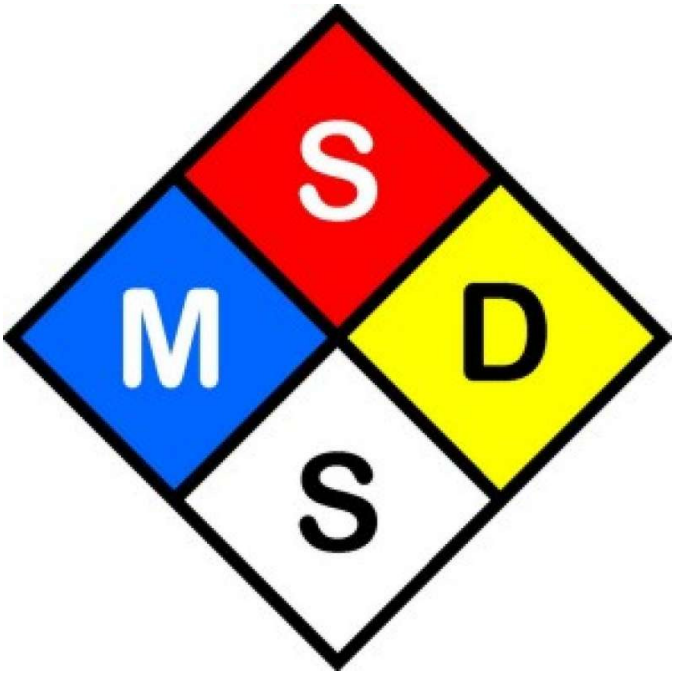


MATERIAL SAFETY AND DATA SHEET [MSDS]

Prepared by

Laboratory and Safety Committees

College of Applied Medical Science

Majmaah University, Al Majmaah-KSA

Forward

By the authority delegated from the College of applied Medical Sciences, Dean and Vice Dean for Quality and Safety is responsible for the safety of all facilities. Under this authority, policies are developed to provide a safe teaching, research, service, housing and recreational environment. The Laboratory and Safety committees (L&SCs) was established in 1435H and given the responsibility for the management of all safety practices and the administration of the program. The mission of the Quality and safety committee is to support and advance the teaching, learning and research activities of the University through promotion of a safe and healthy campus environment. This is accomplished providing and coordinating programs and services that minimize safety, health, environmental and regulatory risks to the Majmaah University community in a manner consistent with responsible fiscal and environmental stewardship. Inherent in this mission is the charge to provide a safe and healthy environment in which the University's activities can be pursued. The University adopts all applicable Universal safety laws, rules and regulations in order to carry out its duties and responsibilities. In additions, L&SCs will reference standards or codes related to safety, which have been adopted and spread by nationally recognized standards-setting organizations. The interpretation of safety codes and standards is the responsibility of the Division of the Laboratory and safety committees. In order to assure an effective The Laboratory and safety committee program for the Majmaah University, it is imperative that all individuals associated with the University comply fully with the policies and procedures set forth in this manual.

Dr. Nasser bin Ali Al-Jarallah

Dean, College of Applied Medical Sciences (CAMS)

Majmaah University, Al Majmaah, KSA.

Policy Statement

It is the policy of the Majmaah University to provide a safe working and learning environment. The Laboratory and Safety Committees has developed Material safety and Data Sheet (MSDS) as a guidance document to familiarize CAMS faculty, staff, students, volunteers, and visitors with the institution-wide policies and procedures for the safe use of hazardous chemical and other material at the University. When these policies and procedures are followed, the risk of occupational exposures to chemicals and physical hazards as well as the risk of accidental environmental release of hazardous materials is minimized. This Material safety and Data Sheet (MSDS) Manual, produced by Laboratory and safety committees, describes policies and procedures that are required for the safe conduct of research at the College of Applied Medical Sciences, Majmaah University.

1. ISIPROPYL ALCOHAL

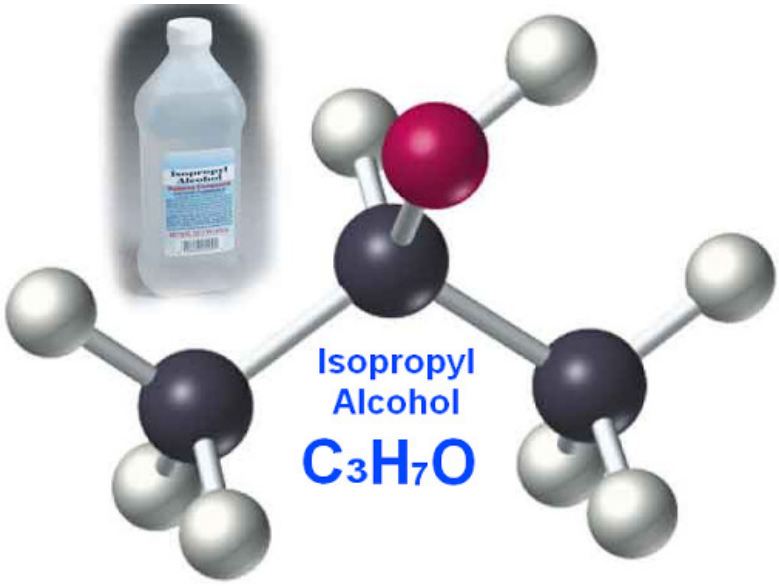
1.1. Chemical Product Identification

1.1.1. **Product Name:** Isopropyl alcohol

1.1.2. **Synonym:** 2-Propanol

1.1.3. **Chemical Name:** isopropanol

1.1.4. **Chemical Formula:** C3-H8-O



1.2. Composition and Information on Ingredients

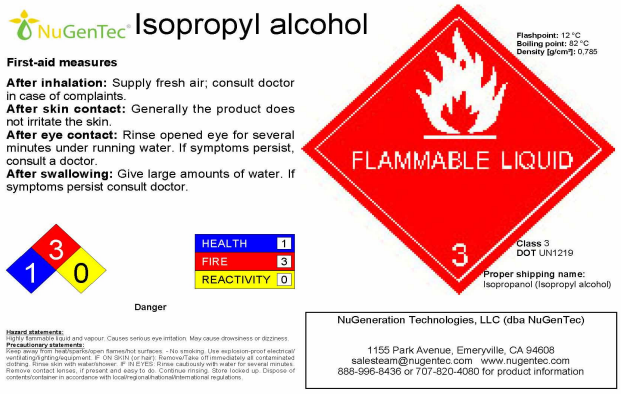
1.2.1. Composition:

1.2.1.1. Name CAS # % by Weight

1.2.1.2. Isopropyl alcohol 67-63-0100

1.2.1.3. Toxicological Data on Ingredients: Isopropyl alcohol: ORAL (LD50): Acute: 5045 mg/kg [Rat]. 3600 mg/kg [Mouse]. 6410 mg/kg [Rabbit]. DERMAL (LD50): Acute: 12800 mg/kg [Rabbit].

1.3. Hazards Identification



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

1.3.2. Potential Chronic Health Effects: Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available.

DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Development toxin [POSSIBLE]. The substance may be toxic to kidneys, liver, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

1.4. First Aid Measures

1.4.1. 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. Cold water may be used. Get medical attention.

1.4.2. Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops. Cold water may be used.

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

1.4.4. 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. Seek medical attention.

1.4.5. Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

1.5. FIRE AND EXPLOSION DATA

1.5.1. Flammability of the Product: Flammable.

1.5.2. Auto-Ignition Temperature: 399°C (750.2°F)

1.5.3. Flash Points: CLOSED CUP: 11.667°C (53°F) - 12.778 deg. C (55 deg. F) (TAG)

1.5.4. Flammable Limits: LOWER: 2% UPPER: 12.7%

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

1.5.6. Fire Hazards in Presence of Various Substances: Highly flammable in presence of open flames and sparks, of heat. Flammable in presence of oxidizing materials. Non- flammable in presence of shocks.

1.5.7. Explosion Hazards in Presence of Various Substances: Risks of explosion of the product in presence of mechanical impact: Not available. Explosive in presence of open flames and sparks, of heat.

1.5.8. Fire Fighting Media and Instructions: Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

1.5.9. Special Remarks on Fire Hazards: Vapor may travel considerable distance to source of ignition and flash back. CAUTION: MAY BURN WITH NEAR INVISIBLE FLAME. Hydrogen peroxide sharply reduces the autoignition temperature of Isopropyl alcohol. After a delay, Isopropyl alcohol ignites on contact with dioxgenyl tetrafluorborate, chromium trioxide, and potassium tert-butoxide. When heated to decomposition it emits acrid smoke and fumes.

1.5.10. Special Remarks on Explosion Hazards: Secondary alcohols are readily

autooxidized in contact with oxygen or air, forming ketones and hydrogen peroxide. It can become potentially explosive. It reacts with oxygen to form dangerously unstable peroxides which can concentrate and explode during distillation or evaporation. The presence of 2-butanone increases the reaction rate for peroxide formation. Explosive in the form of vapor when exposed to heat or flame. May form explosive mixtures with air. Isopropyl alcohol + phosgene forms isopropyl chloroformate and hydrogen chloride. In the presence of iron salts, thermal decompositon can occur, whicn in some cases can become explosive. A homogeneous mixture of concentrated peroxides + isopropyl alcohol are capable of detonation by shock or heat. Barium perchlorate + isopropyl alcohol gives the highly explosive alkyl perchlorates.

It forms explosive mixtures with trinitormethane and hydrogen peroxide. It produces a violent explosive reaction when heated with aluminum isopropoxide + crotonaldehyde. Mixtures of isopropyl alcohol + nitroform are explosive.

1.6. Accidental Release Measures

1.6.1. Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

1.6.2. Large Spill: Flammable liquid. 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 touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the

MSDS and with local authorities.

1.7. Handling and Storage

1.7.1. Precautions: 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. Avoid contact with eyes. 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. Keep away from incompatibles such as oxidizing agents, acids.

1.7.2. 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).

1.8. Exposure Controls/Personal Protection

1.8.1. 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.

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

1.8.3. Personal Protection in Case of a Large Spill: Splash goggles, Full suit, Vapor respirator, Boots, and 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.

1.8.4. Exposure Limits: TWA: 983 STEL: 1230 (mg/m3) [Australia] TWA: 200 STEL: 400 (ppm) from ACGIH (TLV) [United States] [1999] TWA: 980 STEL: 1225 (mg/m3) from NIOSH TWA: 400 STEL: 500 (ppm) from NIOSH TWA: 400 STEL: 500 (ppm) [United Kingdom (UK)] TWA: 999 STEL: 1259 (mg/m3) [United Kingdom (UK)] TWA: 400 STEL: 500 (ppm) from OSHA (PEL) [United States] TWA: 980 STEL: 1225 (mg/m3) from OSHA (PEL) [United States]Consult local authorities for acceptable exposure limits.

1.9. Physical and Chemical Properties

1.9.1. Physical state and appearance: Liquid.

1.9.2. Odor: Pleasant. Odor resembling that of a mixture of ethanol and acetone.

1.9.3. Taste: Bitter. (Slight.)

1.9.4. Molecular Weight: 60.1 g/mole

1.9.5. Color: Colorless.

1.9.6. pH (1% soln/water): Not available.

1.9.7. Boiling Point: 82.5°C (180.5°F)

1.9.8. Melting Point: -88.5°C (-127.3°F)

1.9.9. Critical Temperature: 235°C (455°F)

1.9.10. Specific Gravity: 0.78505 (Water = 1)

1.9.11. Vapor Pressure: 4.4 kPa (@ 20°C)

1.9.12. Vapor Density: 2.07 (Air = 1)

1.9.13. Volatility: Not available.

1.9.14. Odor Threshold: 22 ppm (Sittig, 1991) 700 ppm for unadapted panelists (Verschuren, 1983).

1.9.15. Water/Oil Dist. Coeff.: The product is equally soluble in oil and water; log(oil/water) = 0.1

1.9.16. Ionicity (in Water): Not available.

1.9.17. Dispersion Properties: See solubility in water, methanol, diethyl ether, n-octanol, acetone.

1.9.18. Solubility: Easily soluble in cold water, hot water, methanol, diethyl ether, n-octanol, acetone. Insoluble in salt solution. Soluble in benzene. Miscible with most organic solvents including alcohol, ethyl alcohol, chloroform.

1.10. Stability and Reactivity Data

1.10.1. Stability: The product is stable.

1.10.2. Instability Temperature: Not available.

1.10.3. Conditions of Instability: Heat, Ignition sources, incompatible materials

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

1.10.5. Corrosivity: Non-corrosive in presence of glass.

1.10.6. Special Remarks on Reactivity: Reacts violently with hydrogen + palladium combination, nitroform, oleum, COCl2, aluminum triisopropoxide, oxidants Incompatible with acetaldehyde, chlorine, ethylene oxide, isocyanates, acids, alkaline earth, alkali metals, caustics, amines, crotonaldehyde, phosgene, ammonia. Isopropyl alcohol reacts with metallic aluminum at high

temperatures. Isopropyl alcohol attacks some plastics, rubber, and coatings. Vigorous reaction with sodium dichromate + sulfuric acid.

1.10.7. Special Remarks on Corrosivity: May attack some forms of plastic, rubber and coating

1.10.8. Polymerization: Will not occur.

1.11. Toxicological Information

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

1.11.2. Toxicity to Animals: WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 3600 mg/kg [Mouse]. Acute dermal toxicity (LD50): 12800 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 16000 8 hours [Rat].

1.11.3. Chronic Effects on Humans: CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Development toxin [POSSIBLE]. May cause damage to the following organs: kidneys, liver, skin, central nervous system (CNS).

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

1.11.5. Special Remarks on Toxicity to Animals: Not available.

1.11.6. Special Remarks on Chronic Effects on Humans: May cause adverse productive/ tetratogenic effects (fertility, fetoxixity, develop mental abnormaliries (developmental toxin)) based on animal studies. Detected in maternal milk in human.

1.11.7. Special Remarks on other Toxic Effects on Humans: Acute Potential Health Effects: Skin: May cause mild skin irritation, and sensitization. Eyes: Can cause eye irritation. Inhalation: Breathing in small amounts of this material during normal handling is not likely to cause harmful effects. However, breathing large amounts may be harmful and may affect the respiratory system and mucous membranes (irritation), behavior and brain (Central nervous system depression - headache, dizziness, drowsiness, stupor, incoordination, unconciousness, coma and possible death), peripheral nerve and senstation, blood, urinary system, and liver. Ingestion: Swallowing small amouts during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful. Swallowing large amounts may cause gastrointestinal tract irritation with nausea, vomiting and diarrhea, abdominal pain. It also may affect the urinary system, cardiovascular system, sense organs, behavior or central nervous system (somnolence, generally depressed activity, irritability, headache, dizziness, drowsiness), liver, and respiratory system (breathing difficulty). Chronic Potential Health Effects: May cause defatting of the skin and dermatitis and allergic reaction. May cause adverse reproductive effects based on animal data (studies).

1.12. Ecological Information

1.12.1. Ecotoxicity: Ecotoxicity in water (LC50): 100000 mg/l 96 hours [Fathead Minnow]. 64000 mg/l 96 hours [Fathead Minnow].

1.12.2. BOD5 and COD: Not available.

1.12.3. Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

1.12.4. Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

1.12.5. Special Remarks on the Products of Biodegradation: Not available.

1.13. Disposal Considerations

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

1.14. Transport Information

1.14.1. DOT Classification: CLASS 3: Flammable liquid.

1.14.2. Identification: Isopropyl Alcohol UNNA: 1219 PG: II

1.14.3. Special Provisions for Transport: Not available.

1.15. Other Regulatory Information

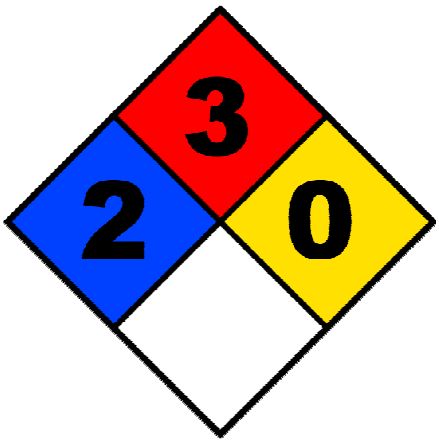
1.15.1. Federal and State Regulations: Connecticut hazardous material survey.: Isopropyl alcohol Illinois toxic substances disclosure to employee act: Isopropyl alcohol Rhode Island RTK hazardous substances: Isopropyl alcohol Pennsylvania RTK: Isopropyl alcohol Florida: Isopropyl alcohol Minnesota: Isopropyl alcohol Massachusetts RTK: Isopropyl alcohol New

Jersey: Isopropyl alcohol New Jersey spill list: Isopropyl alcohol Director's list of Hazardous Substances: Isopropyl alcohol Tennesee: Isopropyl alcohol TSCA 8(b) inventory: Isopropyl alcohol TSCA 4(a) final testing order: Isopropyl alcohol TSCA 8(a) IUR: Isopropyl alcohol TSCA 8(d) H and S data reporting: Isopropyl alcohol: Effective date: 12/15/86 Sunset Date: 12/15/96 TSCA 12(b) one time export: Isopropyl alcohol SARA 313 toxic chemical notification and release reporting: Isopropyl alcohol

1.15.2. Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

1.15.3. Other Classifications: WHMIS (Canada): CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2B: Material causing other toxic effects (TOXIC).

1.15.4. DSCL (EEC): R11- Highly flammable. R36- Irritating to eyes. S7- Keep container tightly closed. S16- Keep away from sources of ignition - No smoking. S24/25- Avoid contact with skin and eyes. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.



1.15.4.1. **HMIS (U.S.A.): Health Hazard:** 2

1.15.4.2. **Fire Hazard:** 3

1.15.4.3. **Reactivity:** 0

1.15.4.4. **Personal Protection:** h

1.15.4.5. **National Fire Protection Association (U.S.A.): Health:** 1

1.15.4.6. **Flammability:** 3

1.15.4.7. **Reactivity:** 0

1.15.5. 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.

1.16. Other Information: The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own

investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

2. FORMALDEHYDE 37% SOLUTION

2.1. Chemical Product Identification

2.1.1. Product Name: Formaldehyde 37% solution

2.1.2. CAS#: Mixture.

2.1.3. TSCA: TSCA 8(b) inventory: Formaldehyde; Methyl alcohol; Water

2.1.4. CI#: Not applicable.

2.1.5. ynonym: Formalin

2.1.6. Chemical Name: Formaldehyde

2.1.7. Chemical Formula: HCHO

2.2. Composition and Information on Ingredients

2.2.1. Composition:

2.2.2.

Name	CAS #	% by Weight
Formaldehyde	50-00-0	36.5-38
Methyl alcohol	67-56-1	10-15
Water	7732-18-5	47-53.5

2.2.3. Toxicological Data on Ingredients: Formaldehyde: ORAL (LD50): Acute: 100 mg/kg [Rat]. 42 mg/kg [Mouse]. 260 mg/kg [Guinea pig]. MIST (LC50): Acute: 454000 mg/m 4 hours [Mouse]. Methyl alcohol: ORAL (LD50): Acute: 5628 mg/kg [Rat]. DERMAL (LD50): Acute: 15800 mg/kg [Rabbit]. VAPOR (LC50): Acute: 64000 ppm 4 hours [Rat].

2.3. Hazards Identification

2.3.1. Potential Acute Health Effects: Very hazardous in case of eye contact (irritant), of ingestion, . Hazardous in case of skin contact (irritant, sensitizer, permeator), of eye contact (corrosive). Slightly hazardous in case of skin contact (corrosive). Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching.

2.3.2. Potential Chronic Health Effects: Hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Classified A2 (Suspected for human.) by ACGIH, 2A (Probable for human.) by IARC [Formaldehyde]. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. [Formaldehyde]. Mutagenic for bacteria and/or yeast. [Formaldehyde]. Mutagenic for mammalian somatic cells. [Methyl alcohol]. Mutagenic for bacteria and/or yeast. [Methyl alcohol].

TERATOGENIC EFFECTS: Classified POSSIBLE for human [Methyl alcohol]. DEVELOPMENTAL TOXICITY: Not available The substance may be toxic to kidneys, liver, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

2.4. First Aid Measures

2.4.1. 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. Get medical attention immediately.

2.4.2. 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. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

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

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

2.4.5. 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.

2.4.6. Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

2.5. Fire and Explosion Data

2.5.1. Flammability of the Product: Flammable.

2.5.2. Auto-Ignition Temperature: 430°C (806°F)

2.5.3. Flash Points: CLOSED CUP: 50°C (122°F). OPEN CUP: 60°C (140°F).

2.5.4. Flammable Limits: The greatest known range is LOWER: 6% UPPER: 36.5% (Methyl alcohol)

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

2.5.6. Fire Hazards in Presence of Various Substances: Flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks, of oxidizing materials, of reducing materials, of combustible materials, of organic materials, of metals, of acids, of alkalis.

2.5.7. Explosion Hazards in Presence of Various Substances: Non-explosive in presence of open flames and sparks, of shocks.

2.5.8. Fire Fighting Media and Instructions: Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE:

Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

2.5.9. Special Remarks on Fire Hazards: Explosive in the form of vapor when exposed to heat or flame. Vapor may travel considerable distance to source of ignition and flash back. When heated to decomposition, it emits acrid smoke and irritating fumes. CAUTION: MAY BURN WITH NEAR INVISIBLE FLAME (Methyl alcohol)

2.5.10. Special Remarks on Explosion Hazards: Reaction with peroxide, nitrogen dioxide, and permformic acid can cause an explosion. (Formaldehyde gas)

2.6. Accidental Release Measures

2.6.1. Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

2.6.2. Large Spill: Flammable liquid. Poisonous liquid. 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. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

2.7. Handling and Storage

2.7.1. Precautions: 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. 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, alkalis, moisture.

2.7.2. 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).

2.8. Exposure Controls/Personal Protection

2.8.1. 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.

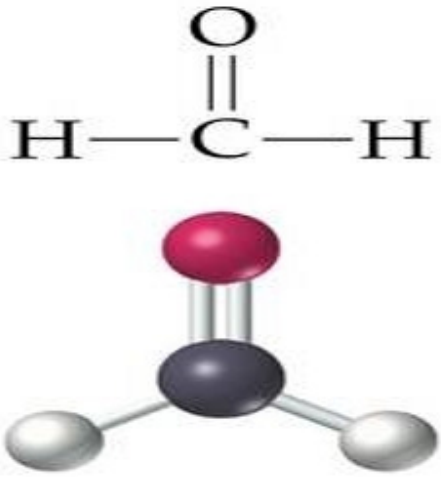
2.8.2. Personal Protection: Safety glasses. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves (impervious).

2.8.3. 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.

2.8.4. Exposure Limits: Formaldehyde gas STEL: 0.3 (ppm) from ACGIH (TLV) [United States] STEL: 0.37 (mg/m3) from ACGIH (TLV) [United States] TWA:

0.75 STEL: 2 (ppm) from OSHA (PEL) [United States] TWA: 2 STEL: 2 (ppm) [United Kingdom (UK)] TWA: 2.5 STEL: 2.5 (mg/m3) [United Kingdom (UK)] Methyl alcohol TWA: 200 from OSHA (PEL) [United States] TWA: 200 STEL: 250 (ppm) from ACGIH (TLV) [United States] [1999] STEL: 250 from NIOSH [United States] TWA: 200 STEL: 250 (ppm) from NIOSH SKIN TWA: 200 STEL: 250 (ppm) [Canada] Consult local authorities for acceptable exposure limits.

2.9. Physical and Chemical Properties



2.9.1. Physical state and appearance: Liquid.

2.9.2. Odor: Pungent. Suffocating. (Strong.)

2.9.3. Taste: Not available.

2.9.4. Molecular Weight: 30.02

2.9.5. Color: Clear Colorless.

2.9.6. pH (1% soln/water): 3 [Acidic.] pH of the solution as is.

2.9.7. Boiling Point: 98°C (208.4°F)

2.9.8. Melting Point: -15°C (5°F)

2.9.9. Critical Temperature: The lowest known value is 240°C (464°F) (Methyl alcohol).

2.9.10. Specific Gravity: 1.08 (Water = 1)

2.9.11. Vapor Pressure: 2.4 kPa (@ 20°C)

2.9.12. Vapor Density: 1.03 (Air = 1)

2.9.13. Volatility: 100% (w/w).

2.9.14. Odor Threshold: The highest known value is 100 ppm (Methyl alcohol)

2.9.15. Water/Oil Dist. Coeff.: Not available.

2.9.16. Ionicity (in Water): Non-ionic.

2.9.17. Dispersion Properties: See solubility in water, diethyl ether, acetone.

2.9.18. Solubility: Easily soluble in cold water, hot water. Soluble in diethyl ether, acetone, alcohol

2.10. Stability and Reactivity Data

2.10.1. Stability: The product is stable.

2.10.2. Instability Temperature: Not available.

2.10.3. Conditions of Instability: Heat, ignition sources (flames, sparks), incompatible materials

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

reducing agents, acids, alkalis. Slightly reactive to reactive with metals.

2.10.5. Corrosivity: Non-corrosive in presence of glass.

2.10.6. Special Remarks on Reactivity: Also incompatible with urea, phenol, isocyanates, anhydrides, amines, AZO compounds, carbonyl compounds, oxides(e.g. nitrogen dioxide), performic acid, dithiocarbmates, or peroxides. Polymerization can be inhibited by the addition of methanol or stabilizers such as hydorxypropyl methyl cellulose, methyl ethyl celluloses, or isophthalobisguanamine.

2.10.7. Special Remarks on Corrosivity: Not available.

2.10.8. Polymerization: Will not occur.

2.11. Toxicological Information

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

2.11.2. Toxicity to Animals: Acute oral toxicity (LD50): 42 mg/kg [Mouse]. (Formaldehyde) Acute dermal toxicity (LD50): 15800 mg/kg [Rabbit]. (Methyl alcohol). Acute toxicity of the mist (LC50): 454000 mg/m 4 hours [Mouse]. (Formaldehyde) 3

2.11.3. Chronic Effects on Humans: CARCINOGENIC EFFECTS: Classified A2 (Suspected for human.) by ACGIH, 2A (Probable for human.) by IARC [Formaldehyde]. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. [Formaldehyde]. Mutagenic for bacteria and/or yeast. [Formaldehyde]. Mutagenic for mammalian somatic cells. [Methyl alcohol]. Mutagenic for bacteria

and/or yeast. [Methyl alcohol]. TERATOGENIC EFFECTS: Classified POSSIBLE for human [Methyl alcohol]. DEVELOPMENTAL TOXICITY: Not available May cause damage to the following organs: kidneys, liver, central nervous system (CNS).

2.11.4. Other Toxic Effects on Humans: Very hazardous in case of ingestion, . Hazardous in case of skin contact (irritant, sensitizer, permeator), of eye contact (corrosive), of inhalation (lung corrosive). Slightly hazardous in case of skin contact (corrosive).

2.11.5. Special Remarks on Toxicity to Animals: Formaldehyde: LD50 [Rabbit] - Route: Skin; Dose: 270 ul/kg

2.11.6. Special Remarks on Chronic Effects on Humans: Exposure to Formaldehyde and Methanol may affect genetic material (mutagenic). Exposure to Formaldehyde and Methanol may cause adverse reproductive effects and birth defects(teratogenic). Adverse reproductive effects of Formaldehyde as well as Methanol are primarily based on animal studies. Very few human studies have been done on the adverse reproductive effects from exposure to Formaldehyde. Studies produced a weak association (limited evidence) between advese human female reproductive effects and occupational exposure. Furthermore, no human data could be found on adverse reproductive effects from occupational exposure to Methanol. Exposure to Formaldehyde may cause cancer.

2.11.7. Special Remarks on other Toxic Effects on Humans: Acute Potential Health Effects: Skin: Corrosive. Causes skin irritation which may range from mild to

severe with possible burns depending on the extent of exposure and concentration of solution. Other symptoms may include brownish discoloration of the skin, urticaria, and pustulovesicffular eruptions. May be absorbed through skin with symptoms paralleling those of ingestion. Eyes: Corrosive. Contact with liquid causes severe eye irritation and burns. It may cause irreversible eye damage (severe corneal Solutions containing low formaldehyde concentrations may produce transient discomfort and irritation. Inhalation: Causes irritiitation of the respiratory tract (nose, throat, airways). Symptoms may include dry and sore mouth and throat, thirst, and sleep disturbances, difficulty breathing, shortness of breath, coughing, sneezing, wheezing rhinitis, chest tightness, pulmonary edema, bronchitis, tracheitis, laryngospasm, pneumonia, palpitations. It may also affect metabolism weight loss, metabolic acidosis), behavior/central nervous system (excitement, central nervous system depression, somnolence, convulsions, stupor, aggression, headache, weakness, dizziness, drowsiness, coma), peripheral nervous system, and blood. Ingestion: Harmful if swallowed. May be fatal. Causes gastrointestinal irritation with nausea, vomiting (possibly with blood), diarrhea, severe pain in mouth, throat and stomach, and possible corrosive injury to the gastrointestinal mucosa/ulceration or bleeding from stomach. May also affect the liver(jaundice), urinary system/kidneys (difficulty urinating, albuminuria, hematuria, anuria), blood, endocrine system, respiration (respiratory obstruction, pulmonary edema, bronchiolar obstruction), cardiovascular system (hypotension), metabolism (metabolic acidosis), eyes (retinal changes, visual field changes), and

behavior/central nervous system (symptoms similar to those for inhalation). Contains Methanol which may cause blindness if swallowed. Chronic Potential Health Effects: Skin: Prolonged or repeated exposure may cause contact dermatits both irritant and allergic. It may also cause skin discoloration. Inhalation: Although there is no clear evidence, prolonged or repeated exposure may induce allergic asthma. Other effects are similar to that of acute exposure. Ingestion: Prolonged or repeated ingestion may cause gastrointestinal tract irritation and ulceration or bleeding from the stomach. Other effects may be similar to that of acute ingestion.

2.12. Ecological Information

2.12.1. Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

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

2.12.3. Special Remarks on the Products of Biodegradation: Methanol in water is rapidly biodegraded and volatilized. Aquatic hydrolysis, oxidation, photolysis, adsorption to sediment, and bioconcentration are not significant fate processes. The half-life of methanol in surfact water ranges from 24 hrs. to 168 hrs. Based on its vapor pressure, methanol exists almost entirely in the vapor phase in the ambient atmosphere. It is degraded by reaction with photochemically produced hydroxyl radicals and has an estimated half-life of 17.8 days. Methanol is physically removed from air by rain due to its solubility. Methanol can react with

NO2 in pollulted to form methyl nitrate. The half-life of methanol in air ranges from 71 hrs. (3 days) to 713 hrs. (29.7 days) based on photooxidation half-life in air. (Methyl alcohol)

2.13. Disposal Considerations

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

2.14. Transport Information

2.14.1. DOT Classification: CLASS 3: Flammable liquid. Class 8: Corrosive material

2.14.2. Identification Formaldehyde Solution, flammable (Methyl alcohol) UNNA: 1198 PG: III

2.14.3. Special Provisions for Transport: Not available.

2.15. Other Regulatory Information

2.15.1. Federal and State Regulations: California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Formaldehyde California prop. 65 (no significant risk level): Formaldehyde: 0.04 mg/day (inhalation) California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Formaldehyde Solution Connecticut hazardous material survey.: Formaldehyde; Methyl alcohol Illinois toxic substances disclosure to employee act: Formaldehyde; Methyl alcohol Illinois chemical safety act: Formaldehyde; Methyl alcohol New York

release reporting list: Formaldehyde; Methyl alcohol Rhode Island RTK hazardous substances: Formaldehyde; Methyl alcohol Pennsylvania RTK: Formaldehyde; Methyl alcohol Minnesota: Formaldehyde gas; Methyl alcohol Massachusetts RTK: Formaldehyde; Methyl alcohol Massachusetts spill list: Formaldehyde; Methyl alcohol New Jersey: Formaldehyde; Methyl alcohol New Jersey spill list: Formaldehyde; Methyl alcohol Louisiana RTK reporting list: Formaldehyde Louisiana spill reporting: Formaldehyde; Methyl alcohol California Director's List of Hazardous Substances: Formaldehyde; Methyl alcohol TSCA 8(b) inventory: Formaldehyde gas; Methyl alcohol; Water TSCA 4(f) priority risk review: Formaldehyde, Reagnt, ACS SARA 302/304/311/312 extremely hazardous substances: Formaldehyde SARA 313 toxic chemical notification and release reporting: Formaldehyde; Methyl alcohol CERCLA: Hazardous substances.: Formaldehyde: 100 lbs. (45.36 kg); Methyl alcohol: 5000 lbs. (2268 kg).

2.15.2. Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

2.15.3. Other Classifications: WHMIS (Canada): CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F). CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

2.15.4. DSCL (EEC): HMIS (U.S.A.):

2.15.4.1. **Health Hazard:** 3

2.15.4.2. **Fire Hazard:** 2

2.15.4.3. **Reactivity:** 0

2.15.4.4. **Personal Protection:** G

2.15.5. National Fire Protection Association (U.S.A.): Health: 3

2.15.5.1. **Flammability:** 2

2.15.5.2. **Reactivity:** 0

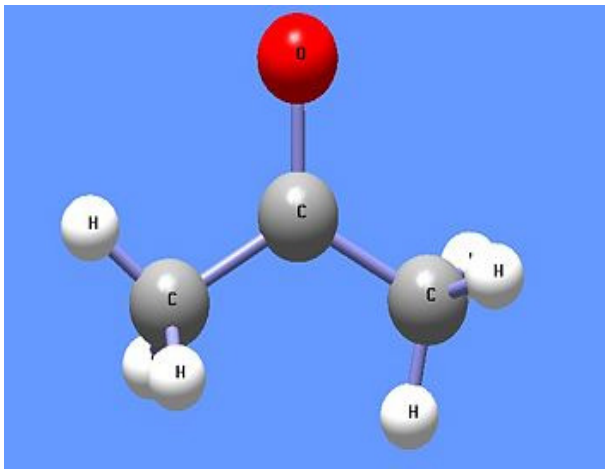
2.15.5.3. **Specific hazard:**

2.15.6. Protective Equipment: Gloves (impervious). Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

2.16. Other Information The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of

merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

3. ACETONE



3.1. Chemical Product Identification

3.1.1. Product Name: Acetone

3.1.2. CAS#: 67-64-1

3.1.3. Inventory: Acetone

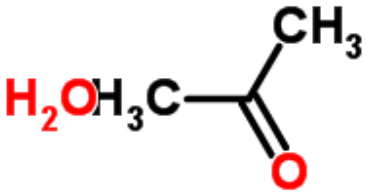
3.1.4. Synonym: 2-propanone; Dimethyl Ketone; Dimethyl formaldehyde; Pyroacetic Acid

3.1.5. Chemical Name: Acetone Chemical Formula: C3-H6-O

3.2. Composition and Information on Ingredients

3.2.1. Composition: Name CAS # % by Weight Acetone 67-64-1100

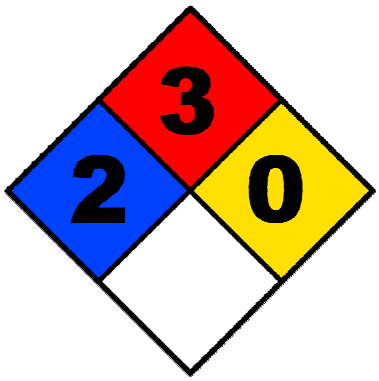
Toxicological Data on Ingredients: Acetone: ORAL (LD50): Acute: 5800 mg/kg [Rat]. 3000 mg/kg [Mouse]. 5340 mg/kg [Rabbit]. VAPOR (LC50): Acute: 50100 mg/m 8 hours [Rat]. 44000 mg/m 4 hours [Mouse].



3.3. Hazards Identification

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

3.3.2. Potential Chronic Health Effects: CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Reproductive system/toxin/male [SUSPECTED]. The substance is toxic to central nervous system (CNS). The substance may be toxic to kidneys, the reproductive system, liver, skin. Repeated or prolonged exposure to the substance can produce target organs damage.



3.4. First Aid Measures

3.4.1. 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. Get medical attention.

3.4.2. 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. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

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

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

3.4.5. 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. Seek medical attention.

3.4.6. Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

3.5. Fire and Explosion Data

3.5.1. Flammability of the Product: Flammable.

3.5.2. Auto-Ignition Temperature: 465°C (869°F)

3.5.3. Flash Points: CLOSED CUP: -20°C (-4°F). OPEN CUP: -9°C (15.8°F) (Cleveland).

3.5.4. Flammable Limits: LOWER: 2.6% UPPER: 12.8%

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

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

3.5.7. 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 oxidizing materials, of acids.

3.5.8. Fire Fighting Media and Instructions: Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

3.5.9. Special Remarks on Fire Hazards: Vapor may travel considerable distance

to source of ignition and flash back.

3.5.10. Special Remarks on Explosion Hazards: Forms explosive mixtures with hydrogen peroxide, acetic acid, nitric acid, nitric acid + sulfuric acid, chromic anydride, chromyl chloride, nitrosyl chloride, hexachloromelamine, nitrosyl perchlorate, nitryl perchlorate, permonosulfuric acid, thiodiglycol + hydrogen peroxide, potassium ter-butoxide, sulfur dichloride, 1-methyl-1,3-butadiene, bromoform, carbon, air, chloroform, thitriazylperchlorate.

3.6. Accidental Release Measures

3.6.1. Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

3.6.2. Large Spill: Flammable liquid. 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 touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

3.7. Handling and Storage

3.7.1. 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, reducing agents, acids, alkalis.

3.7.2. Storage: Store in a segregated and approved area (flammables area) . Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Keep away from direct sunlight and heat and avoid all possible sources of ignition (spark or flame).

3.8. Exposure Controls/Personal Protection

3.8.1.1. 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.

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

3.8.1.3. 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.

3.8.1.4. Exposure Limits: TWA: 500 STEL: 750 (ppm) from ACGIH (TLV) [United States] TWA: 750 STEL: 1000 (ppm) from OSHA (PEL) [United States] TWA: 500 STEL: 1000 [Austalia] TWA: 1185 STEL: 2375 (mg/m3) [Australia] TWA: 750 STEL: 1500 (ppm) [United Kingdom (UK)] TWA: 1810 STEL: 3620 (mg/m3) [United Kingdom (UK)] TWA: 1800 STEL: 2400 from OSHA (PEL)

[United States]Consult local authorities for acceptable exposure limits.

3.9. Physical and Chemical Properties

3.9.1. **Physical state and appearance**: Liquid.

3.9.2. **Odor:** Fruity. Mint-like. Fragrant. Ethereal

3.9.3. **Taste:** Pungent, Sweetish

3.9.4. **Molecular Weight:** 58.08 g/mole

3.9.5. **Color:** Colorless. Clear

3.9.6. **pH** (1% soln/water): Not available. Boiling Point: 56.2°C (133.2°F) Melting Point: -95.35 (-139.6°F) Critical Temperature: 235°C (455°F) Specific Gravity: 0.79 (Water = 1)

3.9.7. **Vapor Pressure:** 24 kPa (@ 20°C) Vapor Density: 2 (Air = 1) Volatility: Not available.

3.9.8. **Odor Threshold**: 62 ppm

3.9.9. Water/Oil Dist. Coeff.: The product is more soluble in water; log(oil/water) = -0.2

3.9.10. **Ionicity (in Water):** Not available.

3.9.11. **Dispersion Properties:** See solubility in water.

3.9.12. **Solubility:** Easily soluble in cold water, hot water.

3.10. Stability and Reactivity Data

3.10.1. **Stability:** The product is stable.

3.10.2. **Instability Temperature:** Not available.

3.10.3. **Conditions of Instability:** Excess heat, ignition sources,

exposure to moisture, air, or water, incompatible materials. Incompatibility with various substances: Reactive with oxidizing agents, reducing agents, acids, alkalis. Corrosivity: Non-corrosive in presence of glass.

3.10.4. Polymerization: Will not occur.

3.11. Toxicological Information

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

3.11.2. Toxicity to Animals: WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 3000 mg/kg [Mouse]. Acute toxicity of the vapor (LC50): 44000 mg/m3 4 hours [Mouse].

3.11.3. Chronic Effects on Humans: CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Reproductive system/toxin/male [SUSPECTED]. Causes damage to the following organs: central nervous system (CNS). May cause damage to the following organs: kidneys, the reproductive system, liver, skin.

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

3.11.5. Special Remarks on Chronic Effects on Humans: May affect genetic material (mutagenicity) based on studies with yeast (S. cerevisiae), bacteria, and hamster fibroblast cells. May cause reproductive effects (fertility) based upon animal studies. May contain trace amounts of benzene and formaldehyde which may cancer and birth defects. Human: passes the placental barrier.

3.11.6. Special Remarks on other Toxic Effects on Humans: Acute Potential Health Effects: Skin: May cause skin irritation. May be harmful if absorbed through the skin. Eyes: Causes eye irritation, characterized by a burning sensation, redness, tearing, inflammation, and possible corneal injury. Inhalation: Inhalation at high concentrations affects the sense organs, brain and causes respiratory tract irritation. It also may affect the Central Nervous System (behavior) characterized by dizzness, drowsiness, confusion, headache, muscle weakeness, and possibly motor incoordination, speech abnormalities, narcotic effects and coma. Inhalation may also affect the gastrointestinal tract (nausea, vomiting). Ingestion: May cause irritation of the digestive (gastrointestinal) tract (nausea, vomiting). It may also affect the Central Nevous System (behavior), characterized by depression, fatigue, excitement, stupor, coma, headache, altered sleep time, ataxia, tremors as well at the blood, liver, and urinary system (kidney, bladder, ureter) and endocrine system. May also have musculoskeletal effects. Chronic

Potential Health Effects: Skin: May cause dermatitis. Eyes: Eye irritation.

3.12. Ecological Information

3.12.1. Ecotoxicity: Ecotoxicity in water (LC50): 5540 mg/l 96 hours [Trout]. 8300 mg/l 96 hours [Bluegill]. 7500 mg/l 96 hours [Fatthead Minnow]. 0.1 ppm any hours [Water flea].

3.12.2. 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 product itself and its products of degradation are not toxic.

3.13. Disposal Considerations

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

3.14. Transport Information

3.14.1. DOT Classification:

3.14.2. CLASS 3: Flammable liquid.

3.14.3. Identification: Acetone UNNA: 1090 PG: II Special Provisions for Transport: Not available.

3.15. Other Regulatory Information

3.15.1. Federal and State Regulations: California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would

require a warning under the statute: Benzene California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Benzene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Benzene, Formaldehyde Connecticut hazardous material survey.: Acetone Illinois toxic substances disclosure to employee act: Acetone Illinois chemical safety act: Acetone New York release reporting list: Acetone Rhode Island RTK hazardous substances: Acetone Pennsylvania RTK: Acetone Florida: Acetone Minnesota: Acetone Massachusetts RTK: Acetone Massachusetts spill list: Acetone New Jersey: Acetone New Jersey spill list: Acetone Louisiana spill reporting: Acetone California List of Hazardous Substances (8 CCR 339): Acetone TSCA 8(b) inventory: Acetone TSCA 4(a) final test rules: Acetone TSCA 8(a) IUR: Acetone

3.15.2. Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

3.15.3. Other Classifications:

3.15.3.1. WHMIS (Canada): CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2B: Material

causing other toxic effects (TOXIC). DSCL (EEC): R11- Highly flammable. R36- Irritating to eyes. S9- Keep container in a well-ventilated place. S16- Keep away from sources of ignition - No smoking. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

3.15.4. HMIS (U.S.A.):

3.15.4.1. Health Hazard: 2

3.15.4.2. Fire Hazard: 3

3.15.4.3. Reactivity: 0

3.15.4.4. Personal Protection: h

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

3.15.4.6. Health: 1

3.15.4.7. Flammability: 3

3.15.4.8. Reactivity: 0

3.15.5. 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.

3.16. Other Information

3.16.1. References: Material safety data sheet issued by: la Commission de la SantÃ© et de la SÃ©curitÃ© du Travail du QuÃ©bec. -The Sigma- Aldrich Library of Chemical Safety Data, Edition II. -Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. LOLI, RTECS, HSDB databases.

4.0 DIPHENYLCARBAZONE-XYLENE CYANOL FF

4.1 **Chemical Product** Identification

4.1.1 Product Name: Diphenylcarbazone-Xylene Cyanol FF

4.1.2 CAS#: Mixture.

4.1.3 TSCA: TSCA 8(b) inventory: 1,5-Diphenylcarbazone; Xylene cyanol FF, C.I. 42135; Nitric acid, 70%; Water; Ethyl alcohol 200 Proof

4.1.4 CI#: Not applicable

4.2 Composition and Information on Ingredients

4.2.1 **Composition:**

Name	**CAS #**	**%**
{1,5-}Diphenylcarbazone	538-62-	0.25
Xylene cyanol FF, C.I. 42135	2650-	0.03
		5.99
Water	7732-	
Nitric acid, fuming	7697-	2.8
Ethyl alcohol 200 Proof	64-17-5	90.9

4.2.2 Toxicological Data on Ingredients: 1,5-Diphenylcarbazone LD50: Not available. LC50: Not available. Nitric acid, fuming: VAPOR (LC50): Acute:

67 ppm 4 hour(s) [Rat]. Ethyl alcohol 200 Proof: ORAL (LD50): Acute: 7060 mg/kg [Rat.]. VAPOR (LC50): Acute: 8000 ppm 4 hour(s) [Rat.].

4.3 Hazards Identification

4.3.1 Potential Acute Health Effects: Very hazardous in case of skin contact (irritant), of eye contact (irritant). Hazardous in case of skin contact (corrosive, permeator), of ingestion, of inhalation. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

4.3.2 **Potential Chronic Health Effects:** Hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant), of ingestion, of inhalation. Non- sensitizer for skin. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: PROVEN [Ethyl alcohol 200 Proof] The substance is toxic to lungs, mucous membranes, the reproductive system. Repeated or prolonged exposure to the

substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

4.4 First Aid Measures

4.4.1 **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.

4.4.2 **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.

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

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

4.4.5 **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.

4.4.6 **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.

4.5 Fire and Explosion Data

4.5.1 **Flammability of the Product: Flammable.**

4.5.2 **Auto-Ignition Temperature:** The lowest known value is 422°C (791.6°F) (Ethyl alcohol 200 Proof).

4.5.3 **Flash Points:** The lowest known value is CLOSED CUP: 12.78°C (55°F). OPEN CUP: 12.78°C (55°F). (Cleveland). (Ethyl alcohol 200 Proof)

4.5.4 **Flammable Limits:** The greatest known range is LOWER: 3.3% UPPER: 19% (Ethyl alcohol 200 Proof) Products of Combustion: These products are carbon oxides (CO, CO2), nitrogen oxides (NO, NO2...). Fire Hazards in Presence of Various SubstancFlammable in presence of open flames and sparks, of heat. Slightly flammable to flammable in presence of oxidizing materials. Non-flammable in presence of reducing materials, of combustible materials, of organic materials.

4.5.5 **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. Slightly explosive to explosive in presence of reducing materials, of combustible materials, of organic materials.

4.5.6 **Fire Fighting Media and Instructions:** Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

4.5.7 **Special Remarks on Fire Hazards:** Containers should be grounded. CAUTION: MAY BURN WITH NEAR INVISIBLE FLAME Vapor may travel considerable distance to source of ignition and flash back. (Ethyl alcohol 200 Proof)

5.1.1 Special Remarks on Explosion Hazards: Not available.

4.6 Accidental Release Measures

4.6.1 **Small Spill:** Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

4.6.2 **Large Spill: Flammable liquid.** Corrosive liquid, 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. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

4.7 Handling and Storage

4.7.1 **Precautions:** Keep locked up Keep container dry. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. Never add water to this product 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.

4.7.2 **Storage:** Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. A refrigerated room would be preferable for materials with a flash point lower than 37.8°C (100°F).

4.8 Exposure Controls/Personal Protection

4.8.1 **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.

4.8.2 **Personal Protection:** Face shield, Full suit, Vapor respirator, Gloves and Boots. Be sure to use an approved/certified respirator or equivalent.

4.8.3 **Personal Protection in Case of a Large Spill:** Splash goggles, Full suit, Vapor respirator, Boots and 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.

4.8.4 **Exposure Limits:** Nitric acid, fuming TWA: 2 CEIL: 4 (ppm) TWA: 5 CEIL: 10 (mg/m3) Ethyl lcohol 200 Proof TWA: 1000 (ppm) from OSHA (PEL) TWA: 1900 (mg/m3) from OSHA Consult local authorities for acceptable exposure limits

4.9 Physical and Chemical Properties

4.9.1 **Physical state and appearance:** Liquid.

4.9.2 **Odor:** Not available.

4.9.3 **Taste:** Not available.

4.9.4 **Molecular Weight:** Not applicable.

4.9.5 **Color:** Not available.

4.9.6 **pH (**1% soln/water): Acidic.

4.9.7 **Boiling Point:** The lowest known value is 78.5°C (173.3°F) (Ethyl alcohol 200 Proof). Weighted average: 79.91°C (175.8°F)

4.9.8 **Melting Point:** May start to solidify at -41.6°C (-42.9°F) based on data for: Nitric acid, fuming. Weighted average: -111.93°C (-169.5°F)

4.9.9 **Critical Temperature:** Not available.

4.9.10 **Specific Gravity:** Weighted average: 0.81 (Water = 1)

4.9.11 **Vapor Pressure:** The highest known value is 45 mm of Hg (@ 20°C) (Nitric acid, fuming). Weighted average: 41.53 mm of Hg (@ 20°C) Vapor Density: The highest

known value is 1.59 (Air = 1) (Ethyl alcohol 200 Proof). Weighted average: 1.53 (Air = 1) Volatility: Not available.

4.9.12 **Odor Threshold:** The highest known value is 0.29 ppm (Nitric acid, fuming)

4.9.13 **Water/Oil Dist. Coeff.:** Not available.

4.9.14 **Ionicity (in Water):** Not available.

4.9.15 **Dispersion Properties:** See solubility in water, methanol, diethyl ether.

4.9.16 **Solubility:** Easily soluble in cold water, hot water, methanol, diethyl ether

4.10 Stability and Reactivity Data

4.10.1 **Stability:** The product is stable.

4.10.2 **Instability Temperature:** Not available.

4.10.3 **Conditions of Instability:** Not available.

4.10.4 **Incompatibility with various substances:** Reactive with oxidizing agents. Slightly reactive to reactive with reducing agents, combustible materials, organic materials, metals, acids, alkalis.

4.10.5 **Corrosivity:** Non-corrosive in presence of glass.

4.10.6 **Special Remarks on Reactivity:** Not available.

4.10.7 **Special Remarks on Corrosivity:** Not available.

4.10.8 **Polymerization:** No.

4.11 Toxicological Information

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

4.11.2 **Toxicity to Animals:** WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 7060 mg/kg [Rat.]. (Ethyl alcohol 200 Proof). Acute toxicity of the vapor (LC50): 67 ppm 4 hour(s) [Rat]. (Nitric acid, fuming).

4.11.3 **Chronic Effects on Humans:** DEVELOPMENTAL TOXICITY: PROVEN [Ethyl alcohol 200 Proof] the substance is toxic to lungs, mucous membranes, the reproductive system.

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

4.11.5 Special Remarks on Toxicity to Animals: Not available.

4.11.6 Special Remarks on Chronic Effects on Humans: Not available.

4.11.7 Special Remarks on other Toxic Effects on Humans: Moderately toxic and narcotic in high concentrations. Experimentaly tumorigen. (Ethyl alcohol 200 Proof)

4.12 Ecological Information

4.12.1 **Ecotoxicity:** Not available. BOD5 and COD: Not available.

4.12.2 **Products of Biodegradation:** Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

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

4.12.4 **Special Remarks on the Products of Biodegradation:** Not available.

4.13 Disposal Considerations

4.13.1 **Waste Disposal:**

4.14 Transport Information

4.14.1 **DOT Classification:** Class 3: Flammable liquid.

4.14.2 **Identification:** Flammable liquid, corrosive, n.o.s. (Ethanol; Nitric acid, solution) (Ethyl alcohol 200 Proof) : UN2924 PG: II

4.14.3 **Special Provisions for Transport:** Marine Pollutant

4.15 Other Regulatory Information

4.15.1 **Federal and State Regulations:** California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Ethyl alcohol 200 Proof California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Ethyl alcohol 200 Proof California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Ethyl alcohol 200 Proof Pennsylvania RTK: Nitric acid, 70%; Ethyl alcohol 200 Proof Massachusetts RTK: Nitric acid,70%; Ethyl alcohol 200 Proof TSCA 8(b) inventory: 1,5-Diphenylcarbazone; Xylene cyanol FF, C.I. 42135; Nitric acid, 70%;Water; Ethyl alcohol 200 Proof SARA 302/304/311/312 extremely hazardous substances: Nitric acid, 70% SARA 313 toxic chemical notification and release reporting: Nitric acid, 70% CERCLA: Hazardous substances.: Nitric acid, 70%.

4.15.2 **Other Regulations: OSHA:** Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

4.15.3 **Other Classifications:** WHMIS (Canada): CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-1A: Material causing immediate

and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

4.15.4 **DSCL (EEC):** R11- Highly flammable. R23- Toxic by inhalation. R36/38- Irritating to eyes and skin.

4.15.4.1 HMIS (U.S.A.):

4.15.4.2 Health Hazard: 2

4.15.4.3 Fire Hazard: 3

4.15.4.4 Reactivity: 0

4.15.5 **Personal Protection:**

4.15.5.1 National Fire Protection Association (U.S.A.): Health: 2

4.15.5.2 Flammability: 3

4.15.5.3 Reactivity: 0

4.15.6 **Specific hazard:** Protective Equipment: Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

5. ACETIC ACID (4-CHLOROPHENYLTHIO)

5.1 Chemical Product Identification

5.1.1 Product Name: (4-Chlorophenylthio)Acetic Acid

5.1.2 Synonyms: p-Chlorophenylmercaptoacetic Acid

5.2 Composition and Information on Ingredients

CAS#	Chemical Name	Perce	EINECS/ELINC
3405-	(4-Chlorophenylthio)Acetic	ca.	Unlisted

5.1.1 Hazard Symbols: XI

5.3 Hazards Identification

5.3.1 Warning!: Causes eye and skin irritation. May cause digestive tract irritation. Causes respiratory tract irritation. Irritant.

5.3.2 Target Organs: No data found.

5.3.3 Potential Health Effects:

5.3.4 Eye: Causes eye irritation. May cause chemical conjunctivitis.

5.3.5 Skin: Causes skin irritation.

5.3.6 Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

5.3.7 Inhalation: Causes respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. Can

produce delayed pulmonary edema.

5.3.8 Chronic: Effects may be delayed.

5.4 First Aid Measures

5.4.1 Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

5.4.2 Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

5.4.3 Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Wash mouth out with water.

5.4.4 Inhalation: Remove from exposure and move 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.

5.4.5 Notes to Physician: Treat symptomatically and supportively.

5.5 Fire and Explosion Data

5.5.1 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. Runoff from fire control

or dilution water may cause pollution.

5.5.2 Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

5.5.3 Flash Point: Not available

5.5.4 Autoignition Temperature: Not available. **Explosion Limits, Lower:** Not available. **Upper:** Not available.

5.5.5 NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

5.6 Accidental Release Measures

5.6.1 General Information: Use proper personal protective equipment as indicated in Section 8.

5.6.2 Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

5.7 Handling and Storage

5.7.1 Handling: Minimize dust generation and accumulation. Avoid breathing dust, vapor, mist, or gas. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Wash clothing before reuse.

5.7.2 Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

5.7.3 Exposure Controls/Personal Protection

5.7.4 Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility

Chemical Name	ACGIH	NIOSH	OSHA
(4-Chlorophenylthio)Acetic Acid	none	none	none

5.7.5 OSHA Vacated PELs: (4-Chlorophenylthio) Acetic Acid: No OSHA Vacated PELs are listed for this chemical.

5.8 Personal Protective Equipment:

5.8.1 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.

5.8.2 Skin: Wear appropriate protective gloves to prevent skin exposure.

5.8.3 Clothing: Wear appropriate protective clothing to prevent skin exposure.

5.8.4 Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

5.9 Physical and Chemical Properties

5.9.1 Physical State: Solid **Appearance:** Not available. **Odor:** stench

5.9.2 pH: Not available.

5.9.3 Vapor Pressure: Not available.

5.9.4 Vapor Density: Not available.

5.9.5 Evaporation Rate: Not available.

5.9.6 Viscosity: Not available.

5.9.7 Boiling Point: Not available.

5.9.8 Freezing/Melting Point: 104 - 107 deg C

5.9.9 Decomposition Temperature: Not available.

5.9.10 Solubility: Not available.

5.9.11 Specific Gravity/Density: Not available.

5.9.12 Molecular Formula: C8H7ClO2S

5.9.13 Molecular Weight: 202.5608

5.10 Stability and Reactivity Data

5.10.1 Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

5.10.2 Conditions to Avoid: Incompatible materials, dust generation, excess heat.

5.10.3 Incompatibilities with Other Materials: Oxidizing agents.

5.10.4 Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, oxides of sulfur, carbon dioxide.

5.10.5 Hazardous Polymerization: Will not occur.

5.11 Toxicological Information

5.11.1 RTECS#:

5.11.2 CAS#: 3405-88-7: AG1075000

5.11.3 LD50/LC50: Not available.

5.11.4 Carcinogenicity: CAS# 3405-88-7: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

5.11.5 Epidemiology: No information available

5.11.6 Teratogenicity: No information available.

5.11.7 Reproductive Effects: No information available.

5.11.8 Neurotoxicity: No information available.

5.11.9 Mutagenicity: No information available.

5.11.10 Other Studies: No data available.

5.12 Other Regulatory Information

5.12.1 US FEDERAL:

5.12.2 TSCA: CAS# 3405-88-7 is not listed on the TSCA inventory. It is for research and development use only.

5.12.3 Health & Safety Reporting List: None of the chemicals are on the Health & Safety Reporting List.

5.12.4 Chemical Test Rules: None of the chemicals in this product are under a Chemical Test Rule.

5.12.5 TSCA Significant New Use Rule: None of the chemicals in this material

have a SNUR under TSCA.

5.12.6 CERCLA Hazardous Substances and corresponding RQs: None of the chemicals in this material have an RQ.

5.12.7 SARA Section 302 Extremely Hazardous Substances: None of the chemicals in this product have a TPQ. **Section 313:** No chemicals are reportable under Section 313.

5.12.8 Clean Air Act: This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

5.12.9 Clean Water Act: None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

5.12.10 OSHA: None of the chemicals in this product are considered highly hazardous by OSHA.

5.12.11 STATE: CAS# 3405-88-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ. California No Significant Risk Level: None of the chemicals in this product are listed.

5.13 European/International Regulations:

5.13.1 European Labeling in Accordance with EC Directives: Hazard Symbols: XI

5.13.2 Risk Phrases: R 36/37/38 Irritating to eyes, respiratory system and skin.

5.13.3 Safety Phrases: S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S 37/39 Wear suitable gloves and eye/face protection.

5.14 Other Information: The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

6.0 EDTA DIAMMONIUM DIHYDROGEN SALT

6.1 Chemical Product Identification

6.1.1 Product Name: EDTA Diammonium Dihydrogen Salt

6.1.2 Catalog Codes: SLE1618

6.1.3 CAS#: 20824-56-0

6.1.4 RTECS: Not available.

6.1.5 TSCA: TSCA 8(b) inventory: EDTA Diammonium Dihydrogen Salt

6.1.6 CI#: Not available.

6.1.7 Synonym: Ethylenediaminetetraacetate Acid Diammonium Dihydrogen Salt; Diammonium Dihydrogen Ethylenediaminetetraacetic Acid Dihydrate; EDTA; Diammonium Edetate

6.1.8 Chemical Name: EDTA Diammonium Dihydrogen Salt

6.1.9 Chemical Formula: C10-H21-N4-O8.xH2O

6.2 Composition and Information on Ingredients

6.2.1 Toxicological Data on Ingredients: EDTA Diammonium Dihydrogen Salt LD50: Not available. LC50: Not available.

Name	CAS #	% by
EDTA Diammonium Dihydrogen Salt	20824-56-0	100

6.3 Hazards Identification

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

6.3.2 Potential Chronic Health Effects: CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

6.4 First Aid Measures

6.4.1 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. Cold water may be used. Get medical attention.

6.4.2 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. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

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

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

6.4.5 Serious Inhalation: Not available.

6.4.6 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.

6.4.7 Serious Ingestion: Not available.

6.5 Fire and Explosion Data

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

6.5.2 Auto-Ignition Temperature: Not available.

6.5.3 Flash Points: CLOSED CUP: Between 61°C (142°F) and 93.3°C (200°F).

6.5.4 Flammable Limits: Not available.

6.5.5 Products of Combustion: These products are carbon oxides (CO, CO2), nitrogen oxides (NO, NO2...). **Fire Hazards in Presence of Various Substances:** Slightly flammable to flammable in presence of heat.

6.5.6 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.

6.5.7 Fire Fighting Media and Instructions:

6.5.8 SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

6.5.9 Special Remarks on Fire Hazards: Not available.

6.5.10 Special Remarks on Explosion Hazards: Not available.

6.6 Accidental Release Measures

6.6.1 Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

6.6.2 Large Spill: Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

6.7 Handling and Storage

6.7.1 Precautions: 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 breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

6.7.2 Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

6.8 Exposure Controls/Personal Protection

6.8.1 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.

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

6.8.3 Personal Protection in Case of a Large Spill: Splash goggles. Full suit. 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.

6.8.4 Exposure Limits: Not available.

6.9 Physical and Chemical Properties

6.9.1 Physical state and appearance: Solid. (powder or fine crystals)

6.9.1.1 Odor: Odorless.

6.9.1.2 Taste: Not available.

6.9.1.3 Molecular Weight: 326.31 g/mole

6.9.1.4 Color: White.

6.9.1.5 pH (1% soln/water): Not available.

6.9.1.6 Boiling Point: Not available.

6.9.1.7 Melting Point: Not available.

6.9.1.8 Critical Temperature: Notavailable.

6.9.1.9 Specific Gravity: Not available.

6.9.1.10 Vapor Pressure: Not applicable.

6.9.1.11 Vapor Density: Not available.

6.9.1.12 Volatility: Not available.

6.9.1.13 Odor Threshold: Not available.

6.9.1.14 Water/Oil Dist. Coeff.: Not available.

6.9.1.15 Ionicity (in Water): Not available.

6.9.1.16 Dispersion Properties: See solubility in water.

6.9.1.17 Solubility: Soluble in cold water, hot water.

6.10 Stability and Reactivity Data

6.10.1 Stability: The product is stable.

6.10.2 Instability Temperature: Not available.

6.10.3 Conditions of Instability: Not available.

6.10.4 Incompatibility with various substances: Reactive with oxidizing agents.

6.10.5 Corrosivity: Not available.

6.10.6 Special Remarks on Reactivity: Not available.

6.10.7 Special Remarks on Corrosivity: Not available.

6.10.8 Polymerization: Will not occur.

6.11 Toxicological Information

6.11.1 Routes of Entry: Inhalation. Ingestion.

6.11.2 Toxicity to Animals: LD50: Not available. LC50: Not available.

6.11.3 Chronic Effects on Humans: Not available.

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

6.11.5 Special Remarks on Toxicity to Animals: Not available.

6.11.6 Special Remarks on Chronic Effects on Humans: No evidence or carciogenicity.

6.11.7 Special Remarks on other Toxic Effects on Humans: Acute Potential Health Effects: Skin: may cause skin irritation Eye: dust may cause eye irritaiton. Inhalation: dust may cause respiratory tract irritation.

6.12 Ecological Information

6.12.1 Ecotoxicity: Not available.

6.12.2 BOD5 and COD: Not available.

6.12.3 Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

6.12.4 Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

6.12.5 Special Remarks on the Products of Biodegradation: Not available.

6.13 Disposal Considerations

6.13.1 Waste Disposal:

6.14 Transport Information

6.14.1 DOT Classification: Not a DOT controlled material (United States).

6.14.2 Identification: Not applicable.

6.14.3 Special Provisions for Transport: Not applicable.

6.15 Other Regulatory Information

6.15.1 Federal and State Regulations: TSCA 8(b) inventory: EDTA Diammonium Dihydrogen Salt.

6.15.2 Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

6.15.3 Other Classifications:

6.15.3.1 WHMIS (Canada): Not controlled under WHMIS (Canada).

6.15.3.1.1 DSCL (EEC): R36/38- Irritating to eyes and skin. S2- Keep out of the reach of children. S46- If swallowed, seek medical advice immediately and show this container or label.

6.15.3.1.2 HMIS (U.S.A.):

6.15.3.1.2.1 Health Hazard: 2

6.15.3.1.2.2 Fire Hazard: 1

6.15.3.1.2.3 Reactivity: 0

6.15.3.1.2.4 Personal Protection: E

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

6.15.4.1 Health: 2

6.15.4.2 Flammability: 2

6.15.4.3 Reactivity: 0

6.15.5 Specific hazard: Protective Equipment: Gloves, Lab coat, Dust respirator, Splash and goggles. Be sure to use an approved/certified respirator or equivalent.

7.0 ETHYLENEDIAMINE TETRAACETIC ACID MSDS

7.1 Chemical Product and Company Identification

7.1.1 Product Name: Ethylenediamine tetraacetic acid

7.1.2 TSCA: TSCA 8(b) inventory: Ethylenediamine tetraacetic acid

7.1.3 CI#: Not available.

7.1.4 Synonym: EDTA; Edetic acid

7.1.5 Chemical Name: Ethylenediamine tetraacetic acid

7.1.6 Chemical Formula: C10H16N2O8

7.2 Composition and Information on Ingredients

7.2.1 Composition:

Name	CAS #	% by
Ethylenediamine tetraacetic acid	60-00-4	100

7.2.2 Toxicological Data on Ingredients: Ethylenediamine tetraacetic acid: ORAL (LD50): Acute: 30 mg/kg [Mouse].

7.3 Hazards Identification

7.3.1 Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Severe over-exposure can result in death.

7.3.2 Potential Chronic Health Effects: CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for mammalian

somatic cells. TERATOGENIC EFFECTS: Classified POSSIBLE for human. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

7.4 First Aid Measures

7.4.1 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. Cold water may be used. WARM water MUST be used. Get medical attention if irritation occurs.

7.4.2 Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

7.4.3 Serious Skin Contact: Not available.

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

7.4.5 Serious Inhalation: Not available.

7.4.6 Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an

unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

7.4.7 Serious Ingestion: Not available.

7.5 Fire and Explosion Data

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

7.5.2 Auto-Ignition Temperature: Not available.

7.5.3 Flash Points: Not available.

7.5.4 Flammable Limits: Not available.

7.5.5 Products of Combustion: These products are carbon oxides (CO, CO2), nitrogen oxides (NO, NO2...).

7.5.6 Fire Hazards in Presence of Various Substances: Slightly flammable to flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

7.5.7 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.

7.5.8 Fire Fighting Media and Instructions: SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

7.5.9 Special Remarks on Fire Hazards: Not available.

7.5.10 Special Remarks on Explosion Hazards: Not available.

7.6 Accidental Release Measures

7.6.1 Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

7.6.2 Large Spill: Poisonous 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.

7.7 Handling and Storage

7.7.1 Precautions: Keep locked up.. 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. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label.

7.7.2 Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 24°C (75.2°F).

7.8 Exposure Controls/Personal Protection

7.8.1 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.

7.8.2 Personal Protection: Safety glasses. Lab coat Gloves. Dust respirator. Be sure to use an approved/certified respirator or equivalent.

7.8.3 Personal Protection in Case of a Large Spill: Splash goggles, Full suit, Boots. Gloves Dust respirator. 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.

7.8.4 Exposure Limits: Not available.

7.9 Physical and Chemical Properties

7.9.1 Physical state and appearance: Solid. (crystalline powder.)

7.9.2 Odor: Not available.

7.9.3 Taste: Not available.

7.9.4 Molecular Weight: 292.28 g/mole

7.9.5 Color: White.

7.9.6 pH (1% soln/water): Not available.

7.9.7 Boiling Point: Not available.

7.9.8 Melting Point: Decomposition temperature: 220-240°C (464°F)

7.9.9 Critical Temperature: Not available.

7.9.10 Specific Gravity: 0.72 (Water = 1)

7.9.11 Vapor Pressure: Not applicable.

7.9.12 .Vapor Density: Not available.

7.9.13 Volatility: Not available.

7.9.14 Odor Threshold: Not available.

7.9.15 Water/Oil Dist. Coeff.: Not available.

7.9.16 Ionicity (in Water): Not available.

7.9.17 Dispersion Properties: Not available.

7.9.18 Solubility: Very slightly soluble in cold water. Insoluble in common organic solvents.

7.10 Stability and Reactivity Data

7.10.1 Stability: The product is stable.

7.10.2 Instability Temperature: Not available.

7.10.3 Conditions of Instability: Excess heat, incompatible materials

7.10.4 Incompatibility with various substances: Not available.

7.10.5 Corrosivity: Non-corrosive in presence of glass.

7.10.6 Special Remarks on Reactivity: Neutralized by alkali metal hydroxides to form a series of water-soluble salts containing from one to four alkali metal cations. No other information at this time.

7.10.7 Special Remarks on Corrosivity: Not available.

7.10.8 Polymerization: Will not occur.

7.11 Toxicological Information

7.11.1 Routes of Entry: Inhalation. Ingestion.

7.11.2 Toxicity to Animals: Acute oral toxicity (LD50): 30 mg/kg [Mouse].

7.11.3 Chronic Effects on Humans: MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. TERATOGENIC EFFECTS: Classified POSSIBLE for human. May cause damage to the following organs: kidneys.

7.11.4 Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

7.11.5 Special Remarks on Toxicity to Animals: Not available.

7.11.6 Special Remarks on Chronic Effects on Humans: May cause adverse reproductive effects (fertility and fetotoxicity) and birth defects based on animal data. May affect genetic material based on animal data.

7.11.7 Special Remarks on other Toxic Effects on Humans: Acute Potential Health Effects: Skin: Can cause skin irritation. Eyes: Can cause eye irritation. Inhalation: Can irritate the nose, throat/respiratory tract, and mucous membranes. Ingestion: May cause gastrointestinal tract irritation. May affect behavior. Chronic Potential Health Effects: Long term exposure via inhalation or ingestion may damage the kidneys.

7.12 Ecological Information

7.12.1 Ecotoxicity: Not available.

7.12.2 BOD5 and COD: Not available.

7.12.3 Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

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

7.12.5 Special Remarks on the Products of Biodegradation: Not available.

7.13 Disposal Considerations

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

7.14 Transport Information

7.14.1 DOT Classification: Not a DOT controlled material (United States).

7.14.2 Identification: Not available. UNNA: NA9117 PG: III

7.14.3 Special Provisions for Transport: Not available.

7.15 Other Regulatory Information

7.15.1 Federal and State Regulations: Connecticut carcinogen reporting list.: Ethylenediamine tetraacetic acid Illinois toxic substances disclosure to employee act: Ethylenediamine tetraacetic acid Illinois chemical safety act: Ethylenediamine tetraacetic acid New York release reporting list: Ethylenediamine tetraacetic acid Pennsylvania RTK: Ethylenediamine tetraacetic acid Massachusetts RTK: Ethylenediamine tetraacetic acid Massachusetts spill list: Ethylenediamine tetraacetic acid New Jersey:

Ethylenediamine tetraacetic acid New Jersey spill list: Ethylenediamine tetraacetic acid California Director's List of Hazardous Substances: Ethylenediamine tetraacetic acid TSCA 8(b) inventory: Ethylenediamine tetraacetic acid CERCLA: Hazardous substances.: Ethylenediamine tetraacetic acid: 5000 lbs. (2268 kg)

7.16 Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

7.16.1 Other Classifications:

7.16.1.1 WHMIS (Canada): Not controlled under WHMIS (Canada).

7.16.1.1.1 DSCL (EEC): R40- Possible risks of irreversible effects. R63- Possible risk of harm to the unborn child. S2- Keep out of the reach of children. S36/37- Wear suitable protective clothing and gloves.

7.16.1.1.2 HMIS (U.S.A.):

7.16.1.1.2.1 Health Hazard: 1

7.16.1.1.2.2 Fire Hazard: 1

7.16.1.1.2.3 Reactivity: 0

7.16.1.1.2.4 Personal Protection: E

7.16.2 National Fire Protection Association (U.S.A.): Health: 1

7.16.2.1 Flammability: 1

7.16.2.2 Reactivity: 0

7.16.3 Specific hazard: Protective Equipment: Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.

8.0 5-Sulfosalicylic acid dihydrate MSDS

8.1 Chemical Product and Company Identification

8.1.1 Product Name: 5-Sulfosalicylic acid dehydrate

8.1.2 Catalog Codes: SLS1678, SLS3100

8.1.3 CAS#: 5965-83-3 (dihydrate) 97-05-2 (anhydrous)

8.1.4 Synonym: 2-Hydroxy-5-sulfobenzoic acid dihydrate; 2-Hydroxybenzoic-5-sulfonic acid dihydrate; 3-Carboxy-4-hydroxybenzenesulfonic acid dihydrate; Salicylsulfonic acid dihydrate; Sulfosalicylic acid dehydrate

8.1.5 Chemical Name: Salicylic acid, 5-sulfo-, dehydrate

8.1.6 Chemical Formula: C7H6O6S.2H20

8.2 Composition and Information on Ingredients

8.2.1 Composition:

Name	CAS #	% by
{5-}Sulfosalicylic acid dihydrate	5965-83-3	100

8.2.2 Toxicological Data on Ingredients: 5-Sulfosalicylic acid (CAS no. 97-05-2): ORAL (LD50): Acute: 2450 mg/kg [Rat] (Sax's Dangerous Properties of Industrial Material Substances). 1850 mg/kg [Rat] (Registry of Toxic Effects of Chemical Substances).

8.3 Hazards Identification

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

8.3.2 Potential Chronic Health Effects: CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to mucous membranes, skin, eyes. Repeated or prolonged exposure to the substance can produce target organs damage.

8.4 First Aid Measures

8.4.1 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. Cold water may be used. Get medical attention.

8.4.2 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. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

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

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

8.4.5 Serious Inhalation: Not available.

8.4.6 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.

8.4.7 Serious Ingestion: Not available.

8.5 Fire and Explosion Data

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

8.5.2 Auto-Ignition Temperature: Not available.

8.5.3 Flash Points: Not available.

8.5.4 Flammable Limits: Not available.

8.5.5 Products of Combustion: These products are carbon oxides (CO, CO2), sulfur oxides (SO2, SO3...).

8.5.6 Fire Hazards in Presence of Various Substances: Slightly flammable to flammable in presence of heat.

8.5.7 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.

8.5.8 Fire Fighting Media and Instructions: SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

8.5.9 Special Remarks on Fire Hazards: As with most organic solids, fire is possible at elevated temperatures

8.5.10 Special Remarks on Explosion Hazards: Not available.

8.6 Accidental Release Measures

8.6.1 Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

8.6.2 Large Spill: Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

8.7 Handling and Storage

8.7.1 Precautions: Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. 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, alkalis.

8.7.2 Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Sensitive to light. Store in light-resistant containers.

8.8 Exposure Controls/Personal Protection

8.8.1 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.

8.8.2 Personal Protection: Splash goggles, Lab coat and Gloves. Dust respirator. Be

sure to use an approved/certified respirator or equivalent.

8.8.3 Personal Protection in Case of a Large Spill: Splash goggles, Full suit, Dust respirator, Boots and 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.

8.8.4 Exposure Limits: Not available.

8.9 Physical and Chemical Properties

8.9.1 Physical state and appearance: Solid. (Powdered solid. Crystalline powder.)

8.9.1.1 Odor: Not available.

8.9.1.2 Taste: Not available.

8.9.1.3 Molecular Weight: 254.22 g/mole

8.9.1.4 Color: White.

8.9.1.5 pH (1% soln/water): Not available.

8.9.1.6 Boiling Point: Not available.

8.9.1.7 Melting Point: 105°C (221°F) - 110 C.

8.9.1.8 Critical Temperature: Not available.

8.9.1.9 Specific Gravity: Not available.

8.9.1.10 Vapor Pressure: Not applicable.

8.9.1.11 Vapor Density: Not available.

8.9.1.12 Volatility: Not available.

8.9.1.13 Odor Threshold: Not available.

8.9.1.14 Water/Oil Dist. Coeff.: Not available.

8.9.1.15 Ionicity (in Water): Not available.

8.9.1.16 Dispersion Properties: See solubility in water, diethyl ether.

8.9.1.17 Solubility: Easily soluble in cold water. Soluble in diethyl ether. Very soluble in alcohol.

8.10 Stability and Reactivity Data

8.10.1 Stability: The product is stable.

8.10.2 Instability Temperature: Not available.

8.10.3 Conditions of Instability: Excess heat, incompatible materials, light

8.10.4 Incompatibility with various substances: Reactive with oxidizing agents, alkalis.

8.10.5 Corrosivity: Non-corrosive in presence of glass.

8.10.6 Special Remarks on Reactivity: Sensitive to light.

8.10.7 Special Remarks on Corrosivity: Not available.

8.10.8 Polymerization: Will not occur.

8.11 Toxicological Information

8.11.1 Routes of Entry: Absorbed through skin. Inhalation. Ingestion.

8.11.2 Toxicity to Animals: 5-Sulfosalicylic acid (CAS no. 97-05-2) Acute oral toxicity (LD50): 1850 mg/kg [Rat] (Registry of Toxic Effects of Chemical Substances).

8.11.3 Chronic Effects on Humans: May cause damage to the following organs: mucous membranes, skin, eyes.

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

8.11.5 Special Remarks on Toxicity to Animals: 5-Sulfosalicylic acid (CAS no. 97-05-2) Lowest Published Conc: LDL [Rabbit] - Route: Skin; Dose: 7940 mg/kg (Registry of Toxic Effects of Chemical Substances)

8.11.6 Special Remarks on Chronic Effects on Humans: Not available.

8.11.7 Special Remarks on other Toxic Effects on Humans: Acute Potential Health Effects: Skin: Causes skin irritation with possible burns. May be absorbed by the skin. It may affect behavior (somnolence) if absorbed by the skin. Eyes: Causes eye irritation with possible burns and conjunctivitis. Inhalation: Causes respiratory tract and mucous membrane irritation. Ingestion: May be harmful if swallowed. Causes gastrointestinal tract irritation. Symptoms may include nausea, vomiting, and diarrhea. It may also affect behavior (somnolence).

8.12 Ecological Information

8.12.1 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.

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

8.12.3 Special Remarks on the Products of Biodegradation: Not available.

8.13 Disposal Considerations

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

8.14 Transport Information

8.14.1 DOT Classification: Not a DOT controlled material (United States).

8.14.2 Identification: Not applicable.

8.14.3 Special Provisions for Transport: Not applicable.

8.15 Other Regulatory Information

8.15.1 Federal and State Regulations: No products were found.

8.15.2 Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). CAS no. 5965-83-3 is not listed on the Canadian DSL. However CAS no. 97-05-2 is listed on the Canadian DSL CAS no. is not listed on the European EINECS Inventory. However, CAS no. 97-05-2 is listed on the European EINECS Inventory Listed on the Japan National Inventory. Listed on the China National Inventory.

8.15.3 Other Classifications: WHMIS (Canada): Not available. It has not been classfied by the Service du repertoire toxicologique. However, due to its irritancy, it might be WHMIS classified as D2B.

8.15.4 DSCL (EEC): R22- Harmful if swallowed. R36/37/38- Irritating to eyes, respiratory system and skin. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36/37- Wear suitable protective clothing and gloves.

8.15.5 HMIS (U.S.A.):

8.15.5.1 Health Hazard: 2

8.15.5.2 Fire Hazard: 1

8.15.5.3 Reactivity: 0

8.15.5.4 Personal Protection: E

8.15.6 National Fire Protection Association (U.S.A.): Health: 2

8.15.6.1 Flammability: 1

8.15.6.2 Reactivity: 0

8.15.6.3 Specific hazard: Protective Equipment: Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Splash goggles.

8.16 Other Information: The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

9.0 Hydrochloric acid MSDS

9.1 Chemical Product and Company Identification

9.1.1 Product Name: Hydrochloric acid

9.1.2 CAS#: Mixture.

9.1.3 Inventory: Hydrochloric acid

9.1.4 Synonym: Hydrochloric Acid; Muriatic Acid

9.1.5 Chemical Name: Not applicable.

9.1.6 Chemical Formula: Not applicable.

9.2 Composition and Information on Ingredients

9.2.1 Composition:

Name	CAS #	% by Weight
Hydrogen	7647-01-0	20-38
Water	7732-18-5	62-80

9.2.2 Toxicological Data on Ingredients: Hydrogen chloride: GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].

9.3 Hazards Identification

9.3.1 Potential Acute Health Effects: Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the

spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

9.3.2 Potential Chronic Health Effects: Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

9.4 First Aid Measures:

9.4.1 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. Cold water may be used. Get medical attention immediately.

9.4.2 **Skin Contact:** In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

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

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

9.4.5 **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.

9.4.6 **Ingestion:** If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

9.4.7 **Serious Ingestion:** Not available.

9.5 Fire and Explosion Data

9.5.1 Flammability of the Product: Non-flammable.

9.5.2 Auto-Ignition Temperature: Not applicable.

9.5.3 Flash Points: Not applicable.

9.5.4 Flammable Limits: Not applicable.

9.5.5 Products of Combustion: Not available.

9.5.6 Fire Hazards in Presence of Various Substances: of metals

9.5.7 Explosion Hazards in Presence of Various Substances: Non-explosive in presence of open flames and sparks, of shocks.

9.5.8 Fire Fighting Media and Instructions: Not applicable.

9.5.9 Special Remarks on Fire Hazards: Non combustible. Calcium carbide reacts with hydrogen chloride gas with incandescence. Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine. Rubidium acetylene carbides burns with slightly warm hydrochloric acid. Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas spontaneously flammable in air is evolved. Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammble gas. Cesium acetylene carbide burns hydrogen chloride gas. Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute. Reacts with most metals to produce flammable Hydrodgen gas.

9.5.10 Special Remarks on Explosion Hazards: Hydrogen chloride in contact with the following can cause an explosion, ignition on contact, or other

violent/vigorous reaction: Acetic anhydride AgClO + CCl4 Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium hydroxide, Calcium carbide Ca3P2 Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylene diamine Ethylene imine, Fluorine, HClO4 Hexalithium disilicide H2SO4 Metal acetylides or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U3P4 , Vinyl acetate. Silver perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

9.6 Accidental Release Measures

9.6.1 **Small Spill:** Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

9.6.2 **Large Spill:** Corrosive liquid. Poisonous liquid. 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. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if

needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

9.7 Handling and Storage

9.7.1 Precautions: Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. 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, organic materials, metals, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

9.7.2 Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

9.8 Exposure Controls/Personal Protection

9.8.1 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.

9.8.2 Personal Protection: Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

9.8.3 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.

9.8.4 Exposure Limits: CEIL: 5 (ppm) from OSHA (PEL) [United States] CEIL: 7 (mg/m3) from OSHA (PEL) [United States] CEIL: 5 from NIOSH CEIL: 7 (mg/m3) from NIOSH TWA: 1 STEL: 5 (ppm) [United Kingdom (UK)] TWA: 2 STEL: 8 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

9.9 Physical and Chemical Properties

9.9.1 Physical state and appearance: Liquid.

9.9.2 Odor: Pungent. Irritating (Strong.

9.9.3 Taste: Not available.

9.9.4 Molecular Weight: Not applicable.

9.9.5 Color: Colorless to light yellow.

9.9.6 pH (1% soln/water): Acidic.

9.9.7 Boiling Point: 108.58 C @ 760 mm Hg (for 20.22% HCl in water) 83 C @ 760 mm Hg (for 31% HCl in water) 50.5 C (for 37% HCl in water)

9.9.8 Melting Point: -62.25°C (-80°F) (20.69% HCl in water) -46.2 C (31.24% HCl in water) -25.4 C (39.17% HCl in water)

9.9.9 Critical Temperature: Not available.

9.9.10 Specific Gravity: 1.1- 1.19 (Water = 1) 1.10 (20%and 22% HCl solutions) 1.12 (24% HCl solution) 1.15 (29.57% HCl solution) 1.16 (32% HCl solution) 1.19 (37% and 38%HCl solutions)

9.9.11 Vapor Pressure: 16 kPa (@ 20°C) average

9.9.12 Vapor Density: 1.267 (Air = 1)

9.9.13 Volatility: Not available.

9.9.14 Odor Threshold: 0.25 to 10 ppm **Water/Oil Dist. Coeff.:** Not available. **Ionicity (in Water):** Not available.

9.9.15 Dispersion Properties: See solubility in water, diethyl ether.

9.9.16 Solubility: Soluble in cold water, hot water, diethyl ether.

9.10 Stability and Reactivity Data

9.10.1 Stability: The product is stable.

9.10.2 Instability Temperature: Not available.

9.10.3 Conditions of Instability: Incompatible materials, water

9.10.4 Incompatibility with various substances: Highly reactive with metals. Reactive with oxidizing agents, organic materials, alkalis, water.

9.10.5 Corrosivity: Extremely corrosive in presence of aluminum, of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

9.10.6 Special Remarks on Reactivity: Reacts with water especially when water is added to the product. Absorption of gaseous hydrogen

chloride on mercuric sulfate becomes violent @ 125 deg. C. Sodium reacts very violently with gaseous hydrogen chloride. Calcium phosphide and hydrochloric acid undergo very energetic reaction. It reacts with oxidizers releasing chlorine gas. Incompatible with, alkali metals, carbides, borides, metal oxides, vinyl acetate, acetylides, sulphides, phosphides, cyanides, carbonates. Reacts with most metals to produce flammable Hydrogen gas. Reacts violently (moderate reaction with heat of evolution) with water especially when water is added to the product. Isolate hydrogen chloride from heat, direct sunlight, alkalies (reacts vigorously), organic materials, and oxidizers (especially nitric acid and chlorates), amines, metals, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure) Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid. Adsorption of Hydrochloric Acid onto silicon dioxide results in exothmeric reaction. Hydrogen chloride causes aldehydes and epoxides to violently polymerize. Hydrogen chloride or Hydrochloric Acid in contact with the folloiwng can cause explosion or ignition on contact.

9.10.7 Special Remarks on Corrosivity: Highly corrosive. Incompatible with copper and copper alloys. It attacks nearly all metals (mercury, gold, platinium, tantalum, silver, and certain alloys are exceptions). It is one of the most corrosive of the nonoxidizing acids in contact with

copper alloys. No corrosivity data on zinc, steel. Severe Corrosive effect on brass and bronze

9.10.8 Polymerization: Will not occur.

9.11 Toxicological Information

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

9.11.2 Toxicity to Animals: Acute oral toxicity (LD50): 900 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1108 ppm, 1 hours [Mouse]. Acute toxicity of the vapor (LC50): 3124 ppm, 1 hours [Rat].

9.11.3 Chronic Effects on Humans: CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. May cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth.

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

9.11.5 Special Remarks on Toxicity to Animals: Lowest Published Lethal Doses (LDL/LCL) LDL [Man] -Route: Oral; 2857 ug/kg LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M

9.11.6 Special Remarks on Chronic Effects on Humans: May cause

adverse reproductive effects (fetoxicity). May affect genetic material.

9.11.7 Special Remarks on other Toxic Effects on Humans: Acute Potential Health Effects: Skin: Corrosive. Causes severe skin irritation and burns. Eyes: Corrosive. Causes severe eye irritation/conjuntivitis, burns, corneal necrosis. Inhalation: May be fatal if inhaled. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation of hydrochloric acid fumes produces nose, throat, and larryngeal burning, and irritation, pain and inflammation, coughing, sneezing, choking sensation, hoarseness, laryngeal spasms, upper respiratory tract edema, chest pains, as well has headache, and palpitations. Inhalation of high concentrations can result in corrosive burns, necrosis of bronchial epithelium, constriction of the larynx and bronchi, nasospetal perforation, glottal closure, occur, particularly if exposure is prolonged. May affect the liver. Ingestion: May be fatal if swallowed. Causes irritation and burning, ulceration, or perforation of the gastrointestinal tract and resultant peritonitis, gastric hemorrhage and infection. Can also cause nausea, vomitting (with "coffee ground" emesis), diarrhea, thirst, difficulty swallowing, salivation, chills, fever, uneasiness, shock, strictures and stenosis (esophogeal, gastric, pyloric). May affect behavior (excitement), the cardiovascular system (weak rapid pulse, tachycardia), respiration (shallow respiration), and urinary system (kidneys- renal failure, nephritis). Acute exposure via inhalation or ingestion can also cause erosion of tooth enamel.

Chronic Potential Health Effects: dyspnea, bronchitis. Chemical pneumonitis and pulmonary edema can also

9.12 Ecological Information

9.12.1 Ecotoxicity: Not available. **BOD5 and COD:** Not available.

9.12.2 Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

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

9.12.4 Special Remarks on the Products of Biodegradation: Not available.

9.13 Disposal Considerations

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

9.14 Transport Information

9.14.1 DOT Classification: Class 8: Corrosive material **Identification:** : Hydrochloric acid, solution UNNA: 1789 PG: II

9.14.2 Special Provisions for Transport: Not available.

9.15 Other Regulatory Information

9.15.1 Federal and State Regulations: Connecticut hazardous material survey.: Hydrochloric acid Illinois toxic substances disclosure to employee act: Hydrochloric acid Illinois chemical safety act: Hydrochloric acid New York release reporting list: Hydrochloric acid Rhode Island RTK hazardous

substances: Hydrochloric acid Pennsylvania RTK: Hydrochloric acid Minnesota: Hydrochloric acid Massachusetts RTK: Hydrochloric acid Massachusetts spill list: Hydrochloric acid New Jersey: Hydrochloric acid New Jersey spill list: Hydrochloric acid Louisiana RTK reporting list: Hydrochloric acid Louisiana spill reporting: Hydrochloric acid California Director's List of Hazardous Substances: Hydrochloric acid TSCA 8(b) inventory: Hydrochloric acid TSCA 4(a) proposed test rules: Hydrochloric acid SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid SARA 313 toxic chemical notification and release reporting: Hydrochloric acid CERCLA: Hazardous substances.: Hydrochloric acid: 5000 lbs. (2268 kg)

9.15.2 Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

9.15.3 Other Classifications: WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

9.15.4 DSCL (EEC): R34- Causes burns. R37- Irritating to respiratory system. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

9.15.5 HMIS (U.S.A.):

9.15.5.1 Health Hazard: 3

9.15.5.2 Fire Hazard: 0

9.15.5.3 Reactivity: 1

9.15.5.4 Personal Protection:

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

9.15.7 Health: 3

9.15.8 Flammability: 0

9.15.9 Reactivity: 1

9.15.10 Specific hazard: Protective Equipment: Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

9.16 Other Information: The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

9.16.1 References: Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité

internatinal Ltée. 1986.

10.0 Methyl alcohol, Absolute MSDS

10.1 Chemical Product Identification

10.1.1 Product Name: Methyl alcohol, Absolute

10.1.2 Catalog Codes: SLM3835

10.1.3 CAS#: 67-56-1

10.1.4 Inventory: Methyl alcohol, Absolute

10.1.5 CI#: Not applicable.

10.1.6 Synonym: Wood alcohol, Methanol; Methylol; Wood Spirit; Carbinol.

10.1.7 Chemical Name: Methanol

10.1.8 Chemical Formula: CH3OH

10.2 Composition and Information on Ingredients

10.2.1 Composition:

Name	CAS #	% by Weight
Methyl alcohol	67-56-1	100

10.2.2 Toxicological Data on Ingredients: Methyl alcohol, Absolute: ORAL (LD50): Acute: 5628 mg/kg [Rat]. DERMAL (LD50): Acute: 15800 mg/kg [Rabbit]. VAPOR (LC50): Acute: 64000 ppm 4 hours [Rat].

10.3 Hazards Identification

10.3.1 Potential Acute Health Effects: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator). Severe over-exposure can result in death.

10.3.2 Potential Chronic Health Effects: Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Classified POSSIBLE for human. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to eyes. The substance may be toxic to blood, kidneys, liver, brain, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS), optic nerve.

10.4 First Aid Measures

10.4.1 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. Get medical attention.

10.4.2 Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

10.4.3 Serious Skin Contact: Wash with a disinfectant soap and cover the

contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

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

10.4.5 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.

10.4.6 Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

10.4.7 Serious Ingestion: Not available.

10.5 Fire and Explosion Data

10.5.1 Flammability of the Product: Flammable.

10.5.2 Auto-Ignition Temperature: 464°C (867.2°F)

10.5.3 Flash Points: CLOSED CUP: 12°C (53.6°F). OPEN CUP: 16°C (60.8°F).

10.5.4 Flammable Limits: LOWER: 6% UPPER: 36.5%

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

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

10.5.7 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.

10.5.8 Fire Fighting Media and Instructions: Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

10.5.9 Special Remarks on Fire Hazards: Explosive in the form of vapor when exposed to heat or flame. Vapor may travel considerable distance to source of ignition and flash back. When heated to decomposition, it emits acrid smoke and irritating fumes. CAUTION: MAY BURN WITH NEAR INVISIBLE FLAME.

10.5.10 Special Remarks on Explosion Hazards: Forms an explosive mixture with air due to its low flash point. Explosive when mixed with Choroform + sodium methoxide and diethyl zinc. It boils violently and explodes.

10.6 Accidental Release Measures

10.6.1 Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

10.6.2 Large Spill: Flammable liquid. Poisonous liquid. 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. Use water spray to reduce vapors. 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.

10.7 Handling and Storage

10.7.1 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, metals, acids.

10.7.2 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).

10.8 Exposure Controls/Personal Protection

10.8.1 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.

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

10.8.3 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.

10.8.4 Exposure Limits: TWA: 200 from OSHA (PEL) [United States] TWA: 200 STEL: 250 (ppm) from ACGIH (TLV) [United States] [1999] STEL: 250 from NIOSH [United States] TWA: 200 STEL: 250 (ppm) from NIOSH SKIN TWA: 200 STEL: 250 (ppm) [Canada] Consult local authorities for acceptable exposure limits.

10.9 Physical and Chemical Properties

10.9.1 Physical state and appearance: Liquid.

10.9.1.1 Odor: Alcohol like. Pungent when crud

10.9.1.2 Taste: Not available.

10.9.1.3 Molecular Weight: 32.04 g/mole

10.9.1.4 Color: Colorless.

10.9.1.5 PH (1% soln/water): Not available

10.9.1.6 Boiling Point: 64.5°C (148.1°F)

10.9.1.7 Melting Point: -97.8°C (-144°F)

10.9.1.8 Critical Temperature: 240°C (464°F)

10.9.1.9 Specific Gravity: 0.7915 (Water = 1)

10.9.1.10 Vapor Pressure: 12.3 kPa (@ 20°C)

10.9.1.11 Vapor Density: 1.11 (Air = 1)

10.9.1.12 Volatility: Not available.

10.9.1.13 Odor Threshold: 100 ppm

10.9.1.14 Water/Oil Dist. Coeff.: The product is more soluble in water; log(oil/water) = -0.8

10.9.1.15 Ionicity (in Water): Non-ionic.

10.9.1.16 Dispersion Properties: See solubility in water.

10.9.1.17 Solubility: Easily soluble in cold water, hot water.

10.10 Stability and Reactivity Data

10.10.1 Stability: The product is stable.

10.10.2 Instability Temperature: Not available.

10.10.3 Conditions of Instability: Heat, ignition sources, incompatible materials

10.10.4 Incompatibility with various substances: Reactive with oxidizing agents, metals, acids

10.10.5 Corrosivity: Non-corrosive in presence of glass.

10.10.6 Special Remarks on Reactivity: Can react vigorously with oxidizers. Violent reaction with alkyl aluminum salts, acetyl bromide, chloroform + sodium methoxide, chromic anhydride, cyanuirc chlorite, lead perchlorate, phosphorous trioxide, nitric acid. Exothermic reaction with sodium hydroxide + chloroform. Incompatible with beryllium dihydride, metals (potassium and magnesium), oxidants (barium perchlorate, bromine, sodium hypochlorite, chlorine, hydrogen peroxide), potassium tert-butoxide, carbon tetrachloride, alkali metals, metals (aluminum, potassium magnesium, zinc), and

dichlormethane. Rapid autocatalytic dissolution of aluminum, magnesium or zinc in 9:1 methanol + carbon tetrachloride - sufficiently vigorous to be rated as potentially hazardous. May attack some plastics, rubber, and coatings.

10.10.7 Special Remarks on Corrosivity: Not available.

10.10.8 Polymerization: Will not occur.

10.11 Toxicological Information

10.11.1 Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

10.11.2 Toxicity to Animals: WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 5628 mg/kg [Rat.]. Acute dermal toxicity (LD50): 15800 mg/kg [Rabbit.]. Acute toxicity of the vapor (LC50): 64000 4 hours [Rat].

10.11.3 Chronic Effects on Humans: MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Classified POSSIBLE for human. Causes damage to the following organs: eyes. May cause damage to the following organs: blood, kidneys, liver, brain, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS), optic nerve.

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

10.11.5 Special Remarks on Toxicity to Animals: Not available

10.11.6 Special Remarks on Chronic Effects on Humans: Passes through the placental barrier. May affect genetic material. May cause birth defects and adverse reproductive effects(paternal and maternal effects and fetotoxicity) based on animal studies.

10.11.7 Special Remarks on other Toxic Effects on Humans: Acute Potential Health effects: May cause eye and skin irritation. Methanol can be absorbed through the skin, producing systemic effects that include visual disturbances. Inhalation: May cause respiratory tract irritation with coughing and wheezing. May affect behavior/central nervous system/peripherial nervous system, gastrointestinal tract, respiration, lungs, and blood, and heart /cardiovascular system (bradycardia, tachydardia). May also cause metabolic acidosis and severed visual effects which may include reduced reactivity/and or increased sensitivity to light, blurred, double/and or snowy vision, and blindness. Ingestion: May be harmful and affect eyes (cause significant visual disturbances including blindness) if swallowed. May cause gastrointestinal tract irritation with abdominal pain, fatigue, nausea, vomiting, and diarrhea

10.12 Ecological Information

10.12.1 Ecotoxicity: Ecotoxicity in water (LC50): 29400 mg/l 96 hours [Fathead Minnow].

10.12.2 BOD5 and COD: Not available.

10.12.3 Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

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

10.12.5 Special Remarks on the Products of Biodegradation: Methanol in water is rapidly biodegraded and volatilized. Aquatic hydrolysis, oxidation, photolysis, adsorption to sediment, and bioconcentration are not significant fate processes. The half-life of methanol in surfact water ranges from 24 hrs. to 168 hrs. Based on its vapor pressure, methanol exists almost entirely in the vapor phase in the ambient atmosphere. It is degraded by reaction with photochemically produced hydroxyl radicals and has an estimated half-life of 17.8 days. Methanol is physically removed from air by rain due to its solubility. Methanol can react with NO2 in pollulted to form methyl nitrate. The half-life of methanol in air ranges from 71 hrs. (3 days) to 713 hrs. (29.7 days) based on photooxidation half-life in air.

10.13 Disposal Considerations

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

10.14 Transport Information

10.14.1 DOT Classification: CLASS 3: Flammable liquid.

10.14.2 Identification: : Methyl alcohol UNNA: 1230 PG: II

10.14.3 Special Provisions for Transport: Not available.

10.15 Other Regulatory Information

10.15.1 Federal and State Regulations: Connecticut hazardous material survey.: Methyl alcohol, Absolute Illinois toxic substances disclosure

to employee act: Methyl alcohol, Absolute Illinois chemical safety act: Methyl alcohol, Absolute New York release reporting list: Methyl alcohol, Absolute Rhode Island RTK hazardous substances: Methyl alcohol, Absolute Pennsylvania RTK: Methyl alcohol, Absolute Minnesota: Methyl alcohol, Absolute Massachusetts RTK: Methyl alcohol, Absolute Massachusetts spill list: Methyl alcohol, Absolute New Jersey: Methyl alcohol, Absolute New Jersey spill list: Methyl alcohol, Absolute Louisiana spill reporting: Methyl alcohol, Absolute California Directors List of Hazardous Substances (8CCR 339): Methyl alcohol, Absolute Tennesse Hazardous Right to Know : Methyl alcohol, Absolute TSCA 8(b) inventory: Methyl alcohol, Absolute SARA 313 toxic chemical notification and release reporting: Methyl alcohol, Absolute CERCLA: Hazardous substances.: Methyl alcohol, Absolute: 5000 lbs. (2268 kg)

10.15.2 Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

10.15.3 Other Classifications: WHMIS (Canada): CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC) Class D-2B: Material causing other toxic effects (TOXIC).

10.15.4 DSCL (EEC): R11- Highly flammable. R23/24/25- Toxic by inhalation, in contact with skin and if swallowed. R39- Danger of very serious irreversible effects. R39/23/24/25- Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed. S7- Keep container tightly closed. S16- Keep away from sources of ignition - No smoking. S36/37- Wear suitable protective clothing and gloves. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

10.15.5 HMIS (U.S.A.):

10.15.5.1 Health Hazard: 2

10.15.5.2 Fire Hazard: 3

10.15.5.3 Reactivity: 0

10.15.5.4 Personal Protection: h

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

10.15.6.1 Health: 1

10.15.6.2 Flammability: 3

10.15.6.3 Reactivity: 0

10.15.7 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.

10.16 Other Information:

10.16.1 References: -SAX, N.I. Dangerous Properties of Indutrial

Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec. -Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. LOLI, HSDB, RTECS, HAZARDTEXT, REPROTOX databases

10.16.2 Other Special Considerations: The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

11.0 Sodium hydroxide MSDS

11.1 Chemical Product Identification

11.1.1 Product Name: Sodium hydroxide

11.1.2 CAS#: 1310-73-2

11.1.3 TSCA: TSCA 8(b) inventory: Sodium hydroxide

11.1.4 CI#: Not available.

11.1.5 Synonym: Caustic Soda

11.1.6 Chemical Name: Sodium Hydroxide

11.1.7 Chemical Formula: NaOH

11.2 Composition and Information on Ingredients

11.2.1 Composition:

Name	CAS #	% by Weight
Sodium hydroxide	1310-73-2	100

11.2.2 Toxicological Data on Ingredients: Sodium hydroxide LD50: Not available. LC50: Not available.

11.3 Hazards Identification

11.3.1 Potential Acute Health Effects: Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, of inhalation. 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. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

11.3.2 Potential Chronic Health Effects: CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to mucous membranes, upper respiratory tract, skin, eyes. 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.

11.4 First Aid Measures

11.4.1 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. Cold water may be used. Get medical attention immediately.

11.4.2 Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before

reuse. Get medical attention immediately.

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

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

11.4.5 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.

11.4.6 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.

11.4.7 Serious Ingestion: Not available.

11.5 Fire and Explosion Data

11.5.1 Flammability of the Product: Non-flammable.

11.5.2 Auto-Ignition Temperature: Not applicable.

11.5.3 Flash Points: Not applicable.

11.5.4 Flammable Limits: Not applicable.

11.5.5 Products of Combustion: Not available.

11.5.6 Fire Hazards in Presence of Various Substances: metals

11.5.7 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. Slightly explosive in presence of heat.

11.5.8 Fire Fighting Media and Instructions: Not available

11.5.9 Special Remarks on Fire Hazards: Sodium hydroxide + zinc metal dust causes ignition of the latter. Under proper conditions of temperature, pressure and state of division, it can ignite or react violently with acetaldehyde, ally alcohol, allyl chloride, benzene-1,4-diol, chlorine trifluoride, 1,2 dichlorethylene, nitroethane, nitromethane, nitroparaffins, nitropropane, cinnamaldehyde, 2,2-dichloro-3,3-dimethylbutane. Sodium hydroxide in contact with water may generate enough heat to ignite adjacent combustible materials. Phosphorous boiled with NaOH yields mixed phosphines which may ignite spontanously in air. sodium hydroxide and cinnamaldehyde + heat may cause ignition. Reaction with certain metals releases flammable and explosive hydrogen gas.

11.5.10 Special Remarks on Explosion Hazards: Sodium hydroxide reacts to form explosive products with ammonia + silver nitrate. Benzene extract of allyl benzenesulfonate prepared from allyl alcohol, and benzene sulfonyl

chloride in presence of aquesous sodium hydroxide, under vacuum distillation, residue darkened and exploded. Sodium Hydroxde + impure tetrahydrofuran, which can contain peroxides, can cause serious explosions. Dry mixtures of sodium hydroxide and sodium tetrahydroborate liberate hydrogen explosively at 230-270 deg. C. Sodium Hydroxide reacts with sodium salt of trichlorophenol + methyl alcohol + trichlorobenzene + heat to cause an explosion.

11.6 Accidental Release Measures.

11.6.1 Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container. If necessary: Neutralize the residue with a dilute solution of acetic acid.

11.6.2 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. Call for assistance on disposal. Neutralize the residue with a dilute solution of acetic acid. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

11.7 Handling and Storage

11.7.1 Precautions: Keep container dry. Do not breathe dust. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Avoid contact with skin and eyes. Keep away from

incompatibles such as oxidizing agents, reducing agents, metals, acids, alkalis, moisture.

11.7.2 Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Hygroscopic. Deliquescent.

11.8 Exposure Controls/Personal Protection

11.8.1 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.

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

11.8.3 Personal Protection in Case of a Large Spill: Splash goggles, Full suit, Vapor and dust respirator, Boots and 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.

11.8.4 Exposure Limits: STEL: 2 (mg/m3) from ACGIH (TLV) [United States] TWA: 2 CEIL: 2 (mg/m3) from OSHA (PEL) [United States] CEIL: 2 (mg/m3) from NIOSHConsult local authorities for acceptable exposure limits.

11.9 Physical and Chemical Properties

11.9.1 Physical state and appearance: Solid. (Deliquescent solid.)

11.9.2 Odor: Odorless.

11.9.3 Taste: Not available.

11.9.4 Molecular Weight: 40 g/mole

11.9.5 Color: White.

11.9.6 pH (1% soln/water): 13.5 [Basic.]

11.9.7 Boiling Point: 1388°C (2530.4°F)

11.9.8 Melting Point: 323°C (613.4°F)

11.9.9 Critical Temperature: Not available.

11.9.10 Specific Gravity: 2.13 (Water = 1)

11.9.11 Vapor Pressure: Not applicable.

11.9.12 Vapor Density: Not available.

11.9.13 Volatility: Not available.

11.9.14 Odor Threshold: Not available.

11.9.15 Water/Oil Dist. Coeff.: Not available.

11.9.16 Ionicity (in Water): Not available.

11.9.17 Dispersion Properties: See solubility in water.

11.9.18 Solubility: Easily soluble in cold water.

11.10 Stability and Reactivity Data

11.10.1 Stability: The product is stable.

11.10.2 Instability Temperature: Not available.

11.10.3 Conditions of Instability: Incompatible materials, moisture, moist air

11.10.4 Incompatibility with various substances: Highly reactive with metals.

Reactive with oxidizing agents, reducing agents, acids, alkalis, moisture.

11.10.5 Corrosivity: Not available.

11.10.6 Special Remarks on Reactivity: Hygroscopic. Much heat is evolved when solid material is dissolved in water. Therefore cold water and caution must be used for this process. Sodium hydroxide solution and octanol + diborane during a work-up of a reaction mixture of oxime and diborane in tetrahyrofuran is very exothermic, a mild explosion being noted on one occassion. Reactive with water, acids (mineral, non-oxidizing, e.g. hydrochloric, hydrofluoric acid, muriatic acid, phosphoric), acids (mineral, oxidizing e.g. chromic acid, hypochlorous acid, nitric acid, sulfuric acid), acids (organic e.g. acetic acid, benzoic acid, formic acid, methanoic acid, oxalic acid), aldehydes (e.g. acetaldehyde, acrolein, chloral hydrate, foraldehyde), carbamates (e.g. carbanolate, carbofuran), esters (e.g. butyl acetate, ethyl acetate, propyl formate), halogenated organics (dibromoethane, hexachlorobenzene, methyl chloride, trichloroethylene), isocyanates (e.g. methyl isocyanate), ketones (acetone, acetophenone, MEK, MIBK), acid chlorides, strong bases, strong oxidizing agents, strong reducing agents, flammable liquids, powdered metals and metals (i.e aluminum, tin, zinc, hafnium, raney nickel), metals (alkali and alkaline e.g. cesium, potassium, sodium), metal compounds (toxic e.g. berylium, lead acetate, nickel carbonyl, tetraethyl lead), mitrides (e.g. potassium nitride, sodium nitride), nitriles (e.g. acetonitrile, methyl cyanide), nitro compounds (organic e.g. nitrobenzene, nitromethane), acetic anhydride, chlorohydrin, chlorosulfonic acid, ethylene

cyanohydrin, glyoxal, hydrosulfuric acid, oleum, propiolactone, acylonitrile, phorosous pentoxide, chloroethanol, chloroform-methanol, tetrahydroborate, cyanogen azide, 1,2,4,5 tetrachlorobenzene, cinnamaldehyde. Reacts with formaldehyde hydroxide to yield formic acid, and hydrogen.

11.10.7 Special Remarks on Corrosivity: Very caustic to aluminum and other metals in presence of moisture.

11.10.8 Polymerization: Will not occur.

11.11 Toxicological Information

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

11.11.2 Toxicity to Animals: LD50: Not available. LC50: Not available.

11.11.3 Chronic Effects on Humans: MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. May cause damage to the following organs: mucous membranes, upper respiratory tract, skin, eyes.

11.11.4 Other Toxic Effects on Humans: Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion, .

11.11.5 Special Remarks on Toxicity to Animals: Lowest Published Lethal Dose: LDL [Rabbit] - Route: Oral; Dose: 500 mg/kg

11.11.6 Special Remarks on Chronic Effects on Humans: May affect genetic material. Investigation as a mutagen (cytogenetic analysis)

11.11.7 Special Remarks on other Toxic Effects on Humans:

11.12 Ecological Information

11.12.1 Ecotoxicity: Not available.

11.12.2 BOD5 and COD: Not available.

11.12.3 Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

11.12.4 Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

11.12.5 Special Remarks on the Products of Biodegradation: Not available.

11.13 Disposal Considerations

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

11.14 Transport Information

11.14.1 DOT Classification: Class 8: Corrosive material

11.14.2 Identification: Sodium hydroxide, solid UNNA: 1823 PG: II

11.14.3 Special Provisions for Transport: Not available.

11.15 Other Regulatory Information

11.15.1 Federal and State Regulations: Illinois toxic substances disclosure to employee act: Sodium hydroxide Illinois chemical safety act: Sodium hydroxide New York release reporting list: Sodium hydroxide Rhode Island RTK hazardous substances: Sodium hydroxide Pennsylvania RTK: Sodium hydroxide Minnesota: Sodium hydroxide Massachusetts RTK: Sodium hydroxide New Jersey: Sodium hydroxide Louisiana spill reporting: Sodium

hydroxide California Director's List of Hazardous Substances: Sodium hydroxide TSCA 8(b) inventory: Sodium hydroxide CERCLA: Hazardous substances.: Sodium hydroxide: 1000 lbs. (453.6 kg)

11.15.2 Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

11.15.3 Other Classifications:

11.15.3.1 WHMIS (Canada): CLASS E: Corrosive solid.

11.15.3.2 DSCL (EEC): R35- Causes severe burns. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S37/39- Wear suitable gloves and eye/face protection. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

11.15.3.3 HMIS (U.S.A.):

11.15.3.3.1 Health Hazard: 3

11.15.3.3.2 Fire Hazard: 0

11.15.3.3.3 Reactivity: 2

11.15.3.3.4 Personal Protection: j

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

11.15.4.1 Health: 3

11.15.4.2 Flammability: 0

11.15.4.3 Reactivity: 1

11.15.5 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.

11.16 Other Information: The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

12.0 Sulfuric acid MSDS

12.1 Chemical Product Identification

12.1.1 Product Name: Sulfuric acid

12.1.2 Inventory: Sulfuric acid

12.1.3 CI#: Not applicable.

12.1.4 Synonym: Oil of Vitriol; Sulfuric Acid

12.1.5 Chemical Name: Hydrogen sulfate

12.1.6 Chemical Formula: H2-SO4

12.2 Composition and Information on Ingredients

12.2.1 Composition:

Name	CAS #	% by Weight
Sulfuric acid	7664-93-9	95 - 98

12.2.2 Toxicological Data on Ingredients: Sulfuric acid: ORAL (LD50): Acute: 2140 mg/kg [Rat.]. VAPOR (LC50): Acute: 510 mg/m 2 hours [Rat]. 320 mg/m 2 hours [Mouse].

12.3 Hazards Identification

12.3.1 Potential Acute Health Effects: Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, of inhalation. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by

coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

12.3.2 Potential Chronic Health Effects: CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA. Classified A2 (Suspected for human.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, lungs, heart, cardiovascular system, upper respiratory tract, eyes, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

12.4 First Aid Measures

12.4.1 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. Cold water may be used. Get medical attention immediately.

12.4.2 Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover

the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

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

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

12.4.5 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.

12.4.6 Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

12.4.7 Serious Ingestion: Not available.

12.5 Fire and Explosion Data

12.5.1 Flammability of the Product: Non-flammable.

12.5.2 Auto-Ignition Temperature: Not applicable.

12.5.3 Flash Points: Not applicable.

12.5.4 Flammable Limits: Not applicable.

12.5.5 Products of Combustion: Products of combustion are not available since material is non-flammable. However, products of decompostion include fumes of oxides of sulfur. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate carbon dioxide gas. Reacts with cyanides and sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.

12.5.6 Fire Hazards in Presence of Various Substances: Combustible materials

12.5.7 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. Slightly explosive in presence of oxidizing materials.

12.5.8 Fire Fighting Media and Instructions: Not applicable.

12.5.9 Special Remarks on Fire Hazards: Metal acetylides (Monocesium and Monorubidium), and carbides ignite with concentrated sulfuric acid. White Phosphorous + boiling Sulfuric acid or its vapor ignites on contact. May ignite other combustible materials. May cause fire when sulfuric acid is mixed with Cyclopentadiene, cyclopentanone oxime, nitroaryl amines, hexalithium disilicide, phorphorous (III) oxide, and oxidizing agents such as chlorates, halogens, permanganates.

12.5.10 Special Remarks on Explosion Hazards: Mixtures of sulfuric acid and any of the following can explode : p- nitrotoluene , pent a silver

trihydroxy diaminophosphate, perchlorates, alcohols with strong hydrogen peroxide, ammonium tetraperoxychromate, mercuric nitrite, potassium chlorate, potassium permanganate with potassium chloride, carbides, nitro compounds, nitrates, carbides, phosphorous, iodides, picratres, fulminats, dienes, alcohols (when heated) Nitramide decomposes explosively on contact with concentrated sulfuric acid. 1,3,5-Trinitrosohexahydro-1,3,5-triazine + sulfuric acid causes explosive decompositon.

12.6 Accidental Release Measures

12.6.1 Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

12.6.2 Large Spill: Corrosive liquid. Poisonous liquid. 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. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

12.7 Handling and Storage

12.7.1 Precautions: Keep locked up.. Keep container dry. Do not ingest. Do not

breathe gas/fumes/ vapor/spray. Never add water to this product. 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, combustible materials, organic materials, metals, acids, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

12.7.2 Storage: Hygroscopic. Reacts. violently with water. Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 23°C (73.4°F).

12.8 Exposure Controls/Personal Protection

12.8.1 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.

12.8.2 Personal Protection: Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

12.8.3 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.

12.8.4 Exposure Limits: TWA: 1 STEL: 3 (mg/m3) [Australia] Inhalation TWA: 1 (mg/m3) from OSHA (PEL) [United States] Inhalation TWA: 1 STEL: 3

(mg/m3) from ACGIH (TLV) [United States] [1999] Inhalation TWA: 1 (mg/m3) from NIOSH [United States] Inhalation TWA: 1 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

12.9 Physical and Chemical Properties

12.9.1 Physical state and appearance: Liquid. (Thick oily liquid.)

12.9.2 Odor: Odorless, but has a choking odor when hot.

12.9.3 Taste: Marked acid taste. (Strong.)

12.9.4 Molecular Weight: 98.08 g/mole **Color:** Colorless.

12.9.5 pH (1% soln/water): Acidic.

12.9.6 Boiling Point:270°C (518°F) - 340 deg. C Decomposes at 340 deg. C

12.9.7 Melting Point: -35°C (-31°F) to 10.36 deg. C (93% to 100% purity)

12.9.8 Critical Temperature: Not available.

12.9.9 Specific Gravity: 1.84 (Water = 1)

12.9.10 Vapor Pressure: Not available.

12.9.11 Vapor Density: 3.4 (Air = 1)

12.9.12 Volatility: Not available.

12.9.13 Odor Threshold: Not available.

12.9.14 Water/Oil Dist. Coeff.: Not available.

12.9.15 Ionicity (in Water): Not available.

12.9.16 Dispersion Properties: See solubility in water.

12.9.17 Solubility: Easily soluble in cold water. Sulfuric is soluble in water with

liberation of much heat. Soluble in ethyl alcohol.

12.10 Stability and Reactivity Data

12.10.1 Stability: The product is stable.

12.10.2 Instability Temperature: Not availabl

12.10.3 Conditions of Instability: Conditions to Avoid: Incompatible materials, excess heat, combustible material materials, organic materials, exposure to moist air or water, oxidizers, amines, bases. Always add the acid to water, never the reverse.

12.10.4 Incompatibility with various substances: Reactive with oxidizing agents, reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture.

12.10.5 Corrosivity: Extremely corrosive in presence of aluminum, of copper, of stainless steel(316). Highly corrosive in presence of stainless steel(304). Non-corrosive in presence of glass.

12.10.6 Special Remarks on Reactivity: Hygroscopic. Strong oxidizer. Reacts violently with water and alcohol especially when water is added to the product. Incompatible (can react explosively or dangerously) with the following: Acetic Acid, Acrylic Acid, Ammonium Hydroxide, Cresol, Cumene, Dichloroethyl Ether, Ethylene Cyanohydrin, Ethyleneimine, Nitric Acid, 2-Nitropropane, Propylene Oxide, Sulfolane, Vinylidene Chloride, Diethylene Glycol Monomethyl Ether, Ethyl Acetate, Ethylene Cyanohydrin, Ethylene Glycol Monoethyl Ether Acetate, Glyoxal, Methyl Ethyl Ketone, dehydrating agents,

organic materials, moisture (water), Acetic anhydride, Acetone, cyanohydrin, Acetone+nitric acid, Acetone + potassium dichromate, Acetonitrile, Acrolein, Acrylonitrile, Acrylonitrile +water, Alcohols + hydrogen peroxide, ally compounds such as Allyl alcohol, and Allyl Chloride, 2-Aminoethanol, Ammonium hydroxide, Ammonium triperchromate, Aniline, Bromate + metals, Bromine pentafluoride, n-Butyraldehyde, Carbides, Cesium acetylene carbide, Chlorates, Cyclopentanone oxime, chlorinates, Chlorates + metals, Chlorine trifluoride, Chlorosulfonic acid, 2-cyano-4-nitrobenzenediazonium hydrogen sulfate, Cuprous nitride, p-chloronitrobenzene, 1,5-Dinitronaphthlene + ulfur, Diisobutylene, p-dimethylaminobenzaldehyde, 1,3-Diazidobenzene, Dimethylbenzylcarbinol + hydrogen peroxide, Epichlorohydrin, Ethyl alcohol + hydrogen peroxide, Ethylene diamine, Ethylene glycol and other glycols, , Ethylenimine, Fulminates, hydrogen peroxide, Hydrochloric acid, Hydrofluoric acid, Iodine heptafluoride, Indane + nitric acid, Iron, Isoprene, Lithium silicide, Mercuric nitride, Mesityl oxide, Mercury nitride, Metals (powdered), Nitromethane, Nitric acid + glycerides, p-Nitrotoluene, Pentasilver trihydroxydiaminophosphate, Perchlorates, Perchloric acid, Permanganates + benzene, 1- Phenyl-2-methylpropyl alcohol + hydrogen peroxide, Phosphorus, Phosphorus isocyanate, Picrates, Potassium tert-butoxide, Potassium chlorate, Potassium Permanganate and other permanganates, halogens, amines,

Potassium Permanganate + Potassium chloride, Potassium Permanganate + water, Propiolactone (beta)-, Pyridine, Rubidium aceteylene carbide, Silver permanganate, Sodium, Sodium carbonate, sodium hydroxide, Steel, styrene monomer, toluene + nitric acid, Vinyl acetate, Thalium (I) azidodithiocarbonate, Zinc chlorate, Zinc Iodide, azides, carbonates, cyanides, sulfides, sulfites, alkali hydrides, carboxylic acid anhydrides, nitriles, olefinic organics, aqueous acids, cyclopentadiene, cyano-alcohols, metal acetylides, Hydrogen gas is generated by the action of the acid on most metals (i.e. lead, copper, tin, zinc, aluminum, etc.). Concentrated sulfuric acid oxidizes, dehydrates, or sulfonates most organic compounds.

12.10.7 Special Remarks on Corrosivity:

12.10.7.1 Non-corrosive to lead and mild steel, but dillute acid attacks most metals. Attacks many metals releasing hydrogen. Minor corrosive effect on bronze. No corrosion data on brass or zinc.

12.10.7.2 Polymerization: Will not occur.

12.11 Toxicological Information

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

12.11.2 Toxicity to Animals: WARNING: THE LC50 VALUES HEREUNDER ARE

ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2140 mg/kg [Rat.]. Acute toxicity of the vapor (LC50): 320 mg/m3 2 hours [Mouse].

12.11.3 Chronic Effects on Humans: CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA. Classified A2 (Suspected for human.) by ACGIH. May cause damage to the following organs: kidneys, lungs, heart, cardiovascular system, upper respiratory tract, eyes and teeth etc.

12.11.4 Other Toxic Effects on Humans: Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion.

12.11.5 Special Remarks on Toxicity to Animals: Not available.

12.11.6 Special Remarks on Chronic Effects on Humans: Mutagenicity: Cytogenetic Analysis: Hamster, ovary = 4mmol/L Reproductive effects: May cause adverse reproductive effects based on animal data. Developmental abnormalities (musculoskeletal) in rabbits at a dose of 20 mg/m3 for 7 hrs.(RTECS) Teratogenecity: neither embryotoxic, fetoxic, nor teratogenetic in mice or rabbits at inhaled doses producing some maternal toxicity

12.11.7 Special Remarks on other Toxic Effects on Humans: Acute Potential Health Effects: Skin: Causes severe skin irritation and burns. Continued contact can cause tissue necrosis. Eye: Causes severe eye irritation and burns. May cause irreversible eye injury. Ingestion: Harmful if swallowed. May cause permanent damage to the digestive tract. Causes gastrointestial tract burns. May cause perforation of the stomach, GI bleeding, edema of the glottis, necrosis and scarring, and sudden circulatory collapse(similar to

acute inhalation). It may also cause systemic toxicity with acidosis. Inhalation: May cause severe irritation of the respiratory tract and mucous membranes with sore throat, coughing, shortness of breath, and delayed lung edema. Causes chemical burns to the repiratory tract. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Cause corrosive action on mucous membranes. May affect cardiovascular system (hypotension, depressed cardiac output, bradycardia). Circulatory collapse with clammy skin, weak and rapid pulse, shallow respiration, and scanty urine may follow. Circulatory shock is often the immediate cause of death. May also affect teeth(changes in teeth and supporting structures - erosion, discoloration). Chronic Potential Health Effects: Inhalation: Prolonged or repeated inhalation may affect behavior (muscle contraction or spasticity), urinary system (kidney damage), and cardiovascular system, heart (ischemic heart leisons), and respiratory system/lungs(pulmonary edema, lung damage), teeth (dental discoloration, erosion). Skin: Prolonged or repeated skin contact may cause dermatitis, an allergic skin reaction.

12.12 Ecological Information

12.12.1 Ecotoxicity: Ecotoxicity in water (LC50): 49 mg/l 48 hours [bluegill/sunfish].

12.12.2 BOD5 and COD: Not available.

12.12.3 Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

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

12.12.5 Special Remarks on the Products of Biodegradation: Not available.

12.13 Disposal Considerations

12.13.1 Waste Disposal: Sulfuric acid may be placed in sealed container or absorbed in vermiculite, dry sand, earth, or a similar material. It may also be diluted and neutralized. Be sure to consult with local or regional authorities (waste regulators) prior to any disposal. Waste must be disposed of in accordance with federal, state and local environmental control regulations.

12.14 Transport Information

12.14.1 DOT Classification: Class 8: Corrosive material

12.14.2 Identification: : Sulfuric acid UNNA: 1830 PG: II

12.14.3 Special Provisions for Transport: Not available.

12.15 Other Regulatory Information

12.15.1 Federal and State Regulations: Illinois toxic substances disclosure to employee act: Sulfuric acid New York release reporting list: Sulfuric acid Rhode Island RTK hazardous substances: Sulfuric acid Pennsylvania RTK: Sulfuric acid Minnesota: Sulfuric acid Massachusetts RTK: Sulfuric acid New Jersey: Sulfuric acid California Director's List of Hazardous Substances (8 CCR 339): Sulfuric acid Tennessee RTK: Sulfuric acid TSCA 8(b) inventory: Sulfuric acid SARA 302/304/311/312 extremely hazardous substances: Sulfuric acid SARA 313 toxic chemical notification and release reporting: Sulfuric acid CERCLA: Hazardous substances.: Sulfuric acid: 1000 lbs. (453.6 kg)

12.15.2 Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

12.15.3 Other Classifications: WHMIS (Canada): CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

12.15.4 DSCL (EEC): R35- Causes severe burns. S2- Keep out of the reach of children. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S30- Never add water to this product. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

12.15.5 HMIS (U.S.A.):

12.15.5.1 Health Hazard: 3

12.15.5.2 Fire Hazard: 0

12.15.5.3 Reactivity: 2

12.15.6 Personal Protection:

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

12.15.6.1.1 Health: 3

12.15.6.1.2 Flammability: 0

12.15.6.1.3 Reactivity: 2

12.15.7 Specific hazard: Protective Equipment: Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear

appropriate respirator when ventilation is inadequate. Face shield.

12.16 Other Information

12.16.1 References: Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.

12.16.2 Other Special Considerations: The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

13.0 Carbol Fuchsin - Ziehl-Neelsen MSDS

13.1 Chemical Product Identification

13.1.1 Product Name: Carbol Fuchsin - Ziehl-Neelsen

13.1.2 CAS#: Mixture.

13.1.3 Inventory: Water; Ethyl alcohol 200 Proof; Phenol; Basic fuchsin

13.1.4 CI#: Not applicable.

13.1.5 Synonym: Carbol Fuchsin Solution, Ziehl-Neelsen

13.1.6 Chemical Name: Not applicable.

13.1.7 Chemical Formula: Not applicable.

13.2 Composition and Information on Ingredients

13.2.1 Composition:

Name	CAS #	% by Weight
Water	7732-18-5	86.5
Ethyl alcohol 200 Proof	64-17-5	8.64
Phenol	108-95-2	4.55
Basic fuchsin	569-61-9	0.27

13.2.2 Toxicological Data on Ingredients: Ethyl alcohol 200 Proof: ORAL (LD50): Acute: 7060 mg/kg [Rat.]. 3450 mg/kg [Mouse]. VAPOR (LC50): Acute: 20000 ppm 8 hours [Rat]. 39000 mg/m 4 hours [Mouse]. Phenol: ORAL (LD50): Acute: 317 mg/kg [Rat]. 270 mg/kg [Mouse]. DERMAL (LD50): Acute: 630 mg/kg [Rabbit]. 669 mg/kg [Rat]. Basic fuchsin: ORAL (LD50): Acute: 5000 mg/kg

[Mouse].

13.3 Hazards Identification

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

13.3.2 Potential Chronic Health Effects: Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Classified PROVEN by State of California Proposition 65 [Ethyl alcohol 200 Proof]. Classified A4 (Not classifiable for human or animal.) by ACGIH [Ethyl alcohol 200 Proof]. Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [Phenol] Classified + (Proven.) by OSHA [Basic fuchsin]. Classified 2B (Possible for human.) by IARC [Basic fuchsin]. Classified 2 (Some evidence.) by NTP [Basic fuchsin]. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. [Ethyl alcohol 200 Proof]. Mutagenic for bacteria and/or yeast. [Ethyl alcohol 200 Proof]. Mutagenic for mammalian somatic cells. [Phenol]. Mutagenic for bacteria and/or yeast. [Phenol]. Mutagenic for mammalian somatic cells. [Basic fuchsin]. Mutagenic for bacteria and/or yeast. [Basic fuchsin]. TERATOGENIC EFFECTS: Classified PROVEN for human [Ethyl alcohol 200 Proof]. DEVELOPMENTAL TOXICITY: Classified Development toxin [PROVEN] [Ethyl alcohol 200 Proof]. Classified Reproductive system/toxin/female, Reproductive

system/toxin/male [POSSIBLE] [Ethyl alcohol 200 Proof]. The substance is toxic to blood, the reproductive system, liver, upper respiratory tract, skin, central nervous system (CNS). The substance may be toxic to kidneys, spleen, thyroid. Repeated or prolonged exposure to the substance can produce target organs damage.

13.4 First Aid Measures

13.4.1 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. Get medical attention.

13.4.2 Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

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

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

13.4.5 Serious Inhalation: Not available.

13.4.6 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.

13.4.7 Serious Ingestion: Not available.

13.5 Fire and Explosion Data

13.5.1 Flammability of the Product: Flammable.

13.5.2 Auto-Ignition Temperature: The lowest known value is 363°C (685.4°F) (Ethyl alcohol 200 Proof).

13.5.3 Flash Points: The lowest known value is CLOSED CUP: 12.78°C (55°F). OPEN CUP: 12.78°C (55°F). (Cleveland). (Ethyl alcohol 200 Proof)

13.5.4 Flammable Limits: The greatest known range is LOWER: 3.3% UPPER: 19% (Ethyl alcohol 200 Proof)

13.5.5 Products of Combustion: These products are carbon oxides (CO, CO2), nitrogen oxides (NO, NO2...), halogenated compounds.

13.5.6 Fire Hazards in Presence of Various Substances: Flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks, of reducing materials, of combustible materials, of organic materials, of metals, of acids, of alkalis.

13.5.7 Explosion Hazards in Presence of Various Substances: Risks of explosion of the product in presence of static discharge: Not available. Non-explosive in presence of shocks.

13.5.8 Fire Fighting Media and Instructions: Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE

FIRE: Use alcohol foam, water spray or fog.

13.5.9 Special Remarks on Fire Hazards: Containers should be grounded. CAUTION: MAY BURN WITH NEAR INVISIBLE FLAME Vapor may travel considerable distance to source of ignition and flash back. May form explosive mixtures with air. Contact with Bromine pentafluoride is likely to cause fire or explosion. Ethanol ignites on contact with chromyl chloride. Ethanol ignites on contact with iodine heptafluoride gas. It ignites than explodes upon contact with nitrosyl perchlorate. Additon of platinum black catalyst caused ignition. (Ethyl alcohol 200 Proof)

13.5.10 Special Remarks on Explosion Hazards: Ethanol has an explosive reaction with the oxidized coating around potassium metal. Ethanol ignites and then explodes on contact with acetic anhydride + sodium hydrosulfate (ignites and may explode), disulfuric acid + nitric acid, phosphorous(III) oxide platinum, potassium-tert-butoxide+ acids. Ethanol forms explosive products in reaction with the following compound : ammonia + silver nitrate (forms silver nitride and silver fulminate), iodine + phosphorus (forms ethane iodide), magnesium perchlorate (forms ethyl perchlorate), mercuric nitrate, nitric acid + silver (forms silver fulminate) silver nitrate (forms ethyl nitrate) silver(I) oxide + ammonia or hydrazine (forms silver nitride and silver fulminate), sodium (evolves hydrogen gas). Sodium Hydrazide + alcohol can produce an explosion. Alcohols should not be mixed with mercuric

nitrate, as explosive mercuric fulminate may be formed. May form explosive mixture with manganese perchlorate + 2,2-dimethoxypropane. Addition of alcohols to highly concentrate hydrogen peroxide forms powerful explosives. Explodes on contact with calcium hypochlorite Vapor may explode if ignited in an enclosed area. Containers may explode when heated or involved in a fire. (Ethyl alcohol 200 Proof)

13.6 Accidental Release Measures

13.6.1 Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

13.6.2 Large Spill: Flammable liquid. 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 touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

13.7 Handling and Storage

13.7.1 Precautions: Keep container dry. 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. Never add water to this product. If

ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes.

13.7.2 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). Sensitive to light. Store in light-resistant containers.

13.8 Exposure Controls/Personal Protection

13.8.1 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.

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

13.8.3 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.

13.9 Physical and Chemical Properties

13.9.1 Physical state and appearance: Liquid.

13.9.2 Odor: Not available.

13.9.3 Taste: Not available.

13.9.4 Molecular Weight: Not applicable.

13.9.5 Color: Purple. (Dark.)

13.9.6 pH (1% soln/water): Neutral.

13.9.7 Boiling Point: The lowest known value is 78.5°C (173.3°F) (Ethyl alcohol 200 Proof). Weighted average: 98.05°C (208.5°F)

13.9.8 Melting Point: May start to solidify at -114.1°C (-173.4°F) based on data for: Ethyl alcohol 200 Proof.

13.9.9 Critical Temperature: The lowest known value is 243°C (469.4°F) (Ethyl alcohol 200 Proof).

13.9.10 Specific Gravity: Weighted average: 0.98 (Water = 1)

13.9.11 Vapor Pressure: The highest known value is 5.7 kPa (@ 20°C) (Ethyl alcohol 200 Proof). Weighted average: 2.61 kPa (@ 20°C)

13.9.12 Vapor Density: The highest known value is 1.59 (Air = 1) (Ethyl alcohol 200 Proof). Weighted average: 0.71 (Air = 1)

13.9.13 Volatility: Not available.

13.9.14 Odor Threshold: The highest known value is 100 ppm (Ethyl alcohol 200 Proof)

13.9.15 Water/Oil Dist. Coeff.: Not available.

13.9.16 Ionicity (in Water): Not available

13.9.17 Dispersion Properties: See solubility in water, methanol, diethyl ether, acetone.

13.9.18 Solubility: Easily soluble in cold water, hot water, methanol, diethyl ether. Soluble in acetone.

13.10 Stability and Reactivity Data

13.10.1 Stability: The product is stable.

13.10.2 Instability Temperature: Not available.

13.10.3 Conditions of Instability: Heat, ignition sources, incompatible materials

13.10.4 Incompatibility with various substances: Slightly reactive to reactive with oxidizing agents, metals, acids, alkalis.

13.10.5 Corrosivity: Not available

13.10.6 Special Remarks on Reactivity: Ethanol rapidly absorbs moisture from the air. Can react vigorously with oxiders. The following oxidants have been demonstrated to undergo vigorous/explosive reaction with ethanol: barium perchlorate, bromine pentafluoride, calcium hypochlorite, chloryl perchlorate, chromium trioxide, chromyl chloride, dioxygen difluoride, disulfuryl difluoride, fluorine nitrate, hydrogen peroxide, iodine heptafluoride, nitric acid nitrosyl perchlorate, perchloric acid permanganic acid, peroxodisulfuric acid, potassium dioxide, potassium perchlorate, potassium permanganate, ruthenium(VIII) oxide, silver perchlorate, silver peroxide, uranium hexafluoride, uranyl perchlorate. Ethanol reacts violently/expodes with the following compounds: acetyl bromide (evolves hydrogen bromide) acetyl chloride, aluminum, sesquibromide ethylate, ammonium hydroxide & silver oxide, chlorate, chromic anhydride, cyanuric acid + water, dichloromethane + sulfuric acid + nitrate (or) nitrite, hydrogen peroxide + sulfuric acid, iodine + methanol + mercuric oxide, manganese perchlorate + 2,2-

dimethoxy propane, perchlorates, permanganates + sulfuric acid, potassium superoxide, potassium tert-butoxide, silver & nitric acid, silver perchlorate, sodium hydrazide, sulfuric acid + sodium dichromate, tetrachlorisilane + water. Ethanol is also incompatible with platinium, and sodium. No really safe conditions exist under which ethyl alcohol and chlorine oxides can be handled. Reacts vigorously with acetyl chloride (Ethyl alcohol 200 Proof) Air and light sensitive. Prone to redden on exposure to light and air. Incompatible with aluminum chloride, peroxydisulfuirc acid, acetaldehyde, sodium nitrite, boron trifluoride diethyl ether + 1,3-butadiene, isocyanates, nitrides, mineral oxidizing acids, calcium hypochlorite, halogens, formaldehyde, metals and alloys, lead, zinc, magnesium and their alloys, plastics, rubber, coatings, sodium nitrate + trifluoroacetic acid. Phenol + isocyanates results in heat generation, and violent polymerization. Phenol + 1,3-butadiene and boron trifluoride diethyl ether complex results in intense exothermic reaction. Phenol + acetaldehyde resultes in violent condensation. (Phenol)

13.10.7 Special Remarks on Corrosivity: Not available.

13.10.8 Polymerization: Will not occur.

13.11 Toxicological Information

13.11.1 Routes of Entry: Absorbed through skin. Eye contact.

13.11.2 Toxicity to Animals: Acute oral toxicity (LD50): 270 mg/kg [Mouse]. (Phenol). Acute dermal toxicity (LD50): 630 mg/kg [Rabbit]. (Phenol).

13.11.3 Chronic Effects on Humans: CARCINOGENIC EFFECTS: Classified PROVEN by State of California Proposition 65 [Ethyl alcohol 200 Proof]. Classified A4 (Not classifiable for human or animal.) by ACGIH [Ethyl alcohol 200 Proof]. Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [Phenol]. Classified + (Proven.) by OSHA [Basic fuchsin]. Classified 2B (Possible for human.) by IARC [Basic fuchsin]. Classified 2 (Some evidence.) by NTP [Basic fuchsin]. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. [Ethyl alcohol 200 Proof]. Mutagenic for bacteria and/ or yeast. [Ethyl alcohol 200 Proof]. Mutagenic for mammalian somatic cells. [Phenol]. Mutagenic for bacteria and/or yeast. [Phenol]. Mutagenic for mammalian somatic cells. [Basic fuchsin]. Mutagenic for bacteria and/or yeast. [Basic fuchsin]. TERATOGENIC EFFECTS: Classified PROVEN for human [Ethyl alcohol 200 Proof]. DEVELOPMENTAL TOXICITY: Classified Development toxin [PROVEN] [Ethyl alcohol 200 Proof]. Classified Reproductive system/toxin/female, Reproductive system/toxin/male [POSSIBLE] [Ethyl alcohol 200 Proof]. Contains material which may cause damage to the following organs: kidneys, spleen, thyroid.

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

13.11.5 Special Remarks on Toxicity to Animals: Lowest Published Lethal Dose: LDL [Human] - Route: Oral; Dose: 140 mg/kg LDL [Infant] - Route: Oral;

Dose: 10,000 mg/kg (Phenol)

13.11.6 Special Remarks on Chronic Effects on Humans: May affect genetic material (mutagenic) Causes adverse reproductive effects and birth defects (teratogenic) , based on moderate to heavy consumption. May cause cancer based on animal data. Human: passes through the placenta, excreted in maternal milk. (Ethyl alcohol 200 Proof) Animal: passes through the placental barrier. May cause adverse reproductive effects and birth defects (teratogenic) Embryotoxic and/or foetotoxic in animal. May affect genetic material (mutagenic). (Phenol)

13.12 Ecological Information

13.12.1 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.

13.12.2 Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the product itself.

13.12.3 Special Remarks on the Products of Biodegradation: Not available.

13.13 Disposal Considerations

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

13.14 Transport Information

13.14.1 DOT Classification: Not a DOT controlled material (United States).

13.14.2 Identification: Not applicable.

13.14.3 Special Provisions for Transport: Not applicable.

13.15 Other Regulatory Information

13.15.1 Federal and State Regulations: California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Ethyl alcohol 200 Proof; Basic fuchsin California prop. 65 (no significant risk level): Basic fuchsin: 0.003 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Ethyl alcohol 200 Proof California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Ethyl alcohol 200 Proof; Basic fuchsin Connecticut hazardous material survey.: Ethyl alcohol 200 Proof; Phenol Illinois toxic substances disclosure to employee act: Ethyl alcohol 200 Proof; Phenol Illinois chemical safety act: Phenol New York release reporting list: Phenol Rhode Island RTK hazardous substances: Ethyl alcohol 200 Proof; Phenol Pennsylvania RTK: Ethyl alcohol 200 Proof; Phenol Florida: Ethyl alcohol 200 Proof; Basic fuchsin Minnesota: Ethyl alcohol 200 Proof; Phenol; Basic fuchsin Massachusetts RTK: Ethyl alcohol 200 Proof; Phenol; Basic fuchsin Massachusetts spill list: Ethyl alcohol 200 Proof; Phenol; Basic fuchsin New Jersey: Ethyl alcohol 200 Proof; Phenol New Jersey spill list: Phenol Louisiana RTK reporting list: Phenol Louisiana spill reporting: Phenol TSCA 8(b) inventory: Water; Ethyl

alcohol 200 Proof; Phenol; Basic fuchsin TSCA 4(a) proposed test rules: Phenol TSCA 8(a) IUR: Phenol TSCA 8(d) H and S data reporting: Phenol: effective: 6/1/87; sunset: 6/01/97 SARA 302/304/311/312 extremely hazardous substances: Phenol SARA 313 toxic chemical notification and release reporting: Phenol 4.55% CERCLA: Hazardous substances.: Phenol: 1000 lbs. (453.6 kg);

13.15.2 Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

13.15.3 Other Classifications: WHMIS (Canada): CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).

13.15.4 DSCL (EEC): R10- Flammable. R21/22- Harmful in contact with skin and if swallowed. R43- May cause sensitization by skin contact. R45- May cause cancer. S24/25- Avoid contact with skin and eyes. S36/37/39- Wear suitable protective clothing, gloves and eye/ face protection. S46- If swallowed, seek medical advice immediately and show this container or label.

13.15.5 HMIS (U.S.A.): Health Hazard: 2

13.15.5.1 Fire Hazard: 2

13.15.5.2 Reactivity: 0

13.15.5.3 Personal Protection: h

13.15.6 National Fire Protection Association (U.S.A.): Health: 3

13.15.7 Flammability: 2

13.15.8 Reactivity: 0

13.15.9 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.

13.16 Other Information: The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

14.0 Methylene Blue Solution I MSDS

14.1 Chemical Product and Company Identification

14.1.1 Product Name: Methylene Blue Solution I

14.1.2 CAS#: Mixture.

14.1.3 Inventory: Methylene blue; Water

14.1.4 CI#: Not available.

14.1.5 Synonym:

14.1.6 Chemical Name: Not applicable.

14.1.7 Chemical Formula: Not applicable.

14.2 Composition and Information on Ingredients

14.2.1 Composition:

Name	CAS #	% by Weight
Methylene blue	61-73-4	0.1
Water	7732-18-5	100

14.2.2 Toxicological Data on Ingredients: Methylene blue: ORAL (LD50): Acute: 1180 mg/kg [Rat].

14.3 Hazards Identification

14.3.1 Potential Acute Health Effects: Non-corrosive for skin. Non-sensitizer for skin.

14.3.2 Potential Chronic Health Effects: Non-corrosive for skin. Non-irritant for skin. Non-sensitizer for skin. Non-permeator by skin. Non-

irritating to the eyes. Non-hazardous in case of ingestion. Non-hazardous in case of inhalation. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available.

14.4 First Aid Measures

14.4.1 Eye Contact: Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used.

14.4.2 Skin Contact: No known effect on skin contact, rinse with water for a few minutes.

14.4.3 Serious Skin Contact: Not available.

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

14.4.5 Serious Inhalation: Not available.

14.4.6 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. Seek immediate medical attention.

14.4.7 Serious Ingestion: Not available.

14.5 Fire and Explosion Data

14.5.1 Flammability of the Product: Non-flammable. **Auto-Ignition Temperature:** Not applicable. **Flash Points:** Not applicable.

14.5.2 Flammable Limits: Not applicable.

14.5.3 Products of Combustion: Not available.

14.5.4 Fire Hazards in Presence of Various Substances: Not applicable.

14.5.5 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.

14.5.6 Fire Fighting Media and Instructions: Not applicable.

14.5.7 Special Remarks on Fire Hazards: Not available.

14.5.8 Special Remarks on Explosion Hazards: Not available.

14.6 Accidental Release Measures

14.6.1 Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

14.6.2 Large Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

14.7 Handling and Storage

14.7.1 Precautions: No specific safety phrase has been found applicable for this product.

14.7.2 Storage: No specific storage is required. Use shelves or cabinets sturdy enough to bear the weight of the chemicals. Be sure that it is not necessary to strain to reach materials, and that shelves are not overloaded.

14.8 Exposure Controls/Personal Protection

14.8.1 Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

14.8.2 Personal Protection: Safety glasses and Lab coat.

14.8.3 Personal Protection in Case of a Large Spill: Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

14.8.4 Exposure Limits: Not available.

14.9 Physical and Chemical Properties

14.9.1 Physical state and appearance: Liquid.

14.9.2 Odor: Not available.

14.9.3 Taste: Not available.

14.9.4 Molecular Weight: Not applicable.

14.9.5 Color: Clear Blue. (Dark.)

14.9.6 pH (1% soln/water): Neutral.

14.9.7 Boiling Point: The lowest known value is 100°C (212°F) (Water).

14.9.8 Melting Point: Not available.

14.9.9 Critical Temperature: Not available.

14.9.10 Specific Gravity: The only known value is 1 (Water = 1) (Water).

14.9.11 Vapor Pressure: The highest known value is 17.535 mm of Hg (@ 20°C) (Water).

14.9.12 Vapor Density: The highest known value is 0.62 (Air = 1) (Water).

14.9.13 Volatility: Not available.

14.9.14 Odor Threshold: Not available. **Water/Oil Dist. Coeff.:** Not available. **Ionicity (in Water):** Not available

14.9.15 Dispersion Properties: See solubility in water.

14.9.16 Solubility: Easily soluble in cold water.

14.10 Stability and Reactivity Data

14.10.1 Stability: The product is stable. **Instability Temperature:** Not available. **Conditions of Instability:** Not available.

14.10.2 Incompatibility with various substances: Not available.

14.10.3 Corrosivity: Non-corrosive in presence of glass, of stainless steel(304), of stainless steel(316).

14.10.4 Special Remarks on Reactivity: Not available. **Special Remarks on Corrosivity:** Not available. **Polymerization:** No.

14.11 Toxicological Information

14.11.1 Routes of Entry: Not available.

14.11.2 Toxicity to Animals: LD50: Not available. LC50: Not available.

14.11.3 Chronic Effects on Humans: Not available.

14.11.4 Other Toxic Effects on Humans: Non-corrosive for skin. Non-sensitizer for skin.

14.11.5 Special Remarks on Toxicity to Animals: Not available.

14.11.6 Special Remarks on Chronic Effects on Humans: Not available.

14.11.7 Special Remarks on other Toxic Effects on Humans: Not available.

14.12 Ecological Information

14.12.1 Ecotoxicity: Not available. **BOD5 and COD:** Not available.

14.12.2 Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

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

14.12.4 Special Remarks on the Products of Biodegradation: Not available.

14.13 Disposal Considerations

14.13.1 Waste Disposal:

14.14 Transport Information

14.14.1 DOT Classification: Not a DOT controlled material (United States).

14.14.2 Identification: Not applicable.

14.14.3 Special Provisions for Transport: Not applicable.

14.15 Other Regulatory Information

14.15.1 Federal and State Regulations: TSCA 8(b) inventory: Methylene blue; Water

14.15.2 Other Regulations: Not available. or of its ingredients

14.15.3 Other Classifications:

14.15.4 WHMIS (Canada): Not controlled under WHMIS (Canada).

14.15.5 DSCL (EEC): This product is not classified according to the EU regulations.

14.15.5.1 HMIS (U.S.A.): Health Hazard: 0

14.15.5.2 Fire Hazard: 0

14.15.5.3 Reactivity: 0

14.15.5.4 Personal Protection: a

14.15.6 National Fire Protection Association (U.S.A.): Health: 0

14.15.6.1 Flammability: 0

14.15.6.2 Reactivity: 0

14.15.7 Specific hazard: Protective Equipment: Not applicable. Lab coat. Not applicable. Safety glasses.

14.16 Other Information The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

15.0 Gentian Violet, 0.1% in Glacial Acetic Acid MSDS

15.1 Chemical Product and Company Identification

15.1.1 Product Name: Gentian Violet, 0.1% in Glacial Acetic Acid

15.1.2 CAS#: Mixture.

15.1.3 RTECS: Not applicable.

15.1.4 TSCA: TSCA 8(b) inventory: Acetic acid; Gentian Violet

15.1.5 CI#: Not applicable.

15.1.6 Synonym:

15.1.7 Chemical Name: Not applicable.

15.1.8 Chemical Formula: Not applicable.

15.2 Composition and Information on Ingredients

15.2.1 Composition:

Name	CAS #	% by Weight
Acetic acid	64-19-7	99.9
Gentian Violet	548-62-9	0.1

15.2.2 Toxicological Data on Ingredients: Acetic acid: ORAL (LD50): Acute: 3310 mg/kg [Rat]. 4960 mg/kg [Mouse]. 3530 mg/kg [Rat]. DERMAL (LD50): Acute: 1060 mg/kg [Rabbit]. VAPOR (LC50): Acute: 5620 ppm 1 hours [Mouse]. Gentian Violet: ORAL (LD50): Acute: 420 mg/kg [Rat]. 96 mg/kg [Mouse]. 150 mg/kg [Rabbit].

15.3 Hazards Identification

15.3.1 Potential Acute Health Effects: Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

15.3.2 Potential Chronic Health Effects: Hazardous in case of skin contact (irritant), of ingestion, of inhalation. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. [Acetic acid]. Mutagenic for bacteria and/or yeast. [Acetic acid]. Mutagenic for bacteria and/or yeast. [Gentian Violet]. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, mucous membranes, skin, teeth. Repeated or prolonged exposure to the substance can produce target organs

damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.

15.4 First Aid Measures

15.4.1 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. Cold water may be used. Get medical attention immediately.

15.4.2 Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

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

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

15.4.5 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.

15.4.6 Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

15.4.7 Serious Ingestion: Not available.

15.5 Fire and Explosion Data

15.5.1 Flammability of the Product: Flammable.

15.5.2 Auto-Ignition Temperature: The lowest known value is 463°C (865.4°F) (Acetic acid).

15.5.3 Flash Points: The lowest known value is CLOSED CUP: 39°C (102.2°F). OPEN CUP: 43°C (109.4°F). (Acetic acid)

15.5.4 Flammable Limits: The greatest known range is LOWER: 4% UPPER: 19.9% (Acetic acid)

15.5.5 Products of Combustion: These products are carbon oxides (CO, CO2), nitrogen oxides (NO, NO2...), halogenated compounds.

15.5.6 Fire Hazards in Presence of Various Substances: Flammable in presence of open flames and sparks, of heat. Slightly flammable to flammable in presence of oxidizing materials, of metals. Non-flammable in presence of shocks.

15.5.7 Explosion Hazards in Presence of Various Substances: Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of oxidizing materials. Non-explosive in presence of shocks.

15.5.8 Fire Fighting Media and Instructions: Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

15.5.9 Special Remarks on Fire Hazards: Reacts with metals to produces flammable hydrogen gas. It will ignite on contact with potassium-tert-butoxide. A mixture of ammonium nitrate and acetic acid ignites when warmed, especially if warmed. (Acetic acid)

15.5.10 Special Remarks on Explosion Hazards: Acetic acid vapors may

form explosive mixtures with air. Reactions between acetic acid and the following materials are potentially explosive: 5-azidotetrazole, bromine pentafluoride, chromium trioxide, hydrogen peroxide, potassium permanganate, sodium peroxide, and phorphorus trichloride. Dilute acetic acid and dilute hydrogen can undergo an exothermic reaction if heated, forming peracetic acid which is explosive at 110 degrees C. Reaction between chlorine trifluoride and acetic acid is very violent, sometimes explosive. (Acetic acid)

15.6 Accidental Release Measures

15.6.1 Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

15.6.2 Large Spill: Flammable liquid. Corrosive liquid. 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. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be

careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

15.7 Handling and Storage

15.7.1 Precautions: 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. 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, metals, acids, alkalis.

15.7.2 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).

15.8 Exposure Controls/Personal Protection

15.8.1 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.

15.8.2 Personal Protection: Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

15.8.3 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.

15.8.4 Exposure Limits: Acetic acid TWA: 10 STEL: 15 (ppm) [Australia] TWA: 25 STEL: 27 (mg/m3) [Australia] TWA: 10 STEL: 15 (ppm) from NIOSH TWA: 25 STEL: 37 (mg/m3) from NIOSH TWA: 10 STEL: 15 (ppm) [Canada] TWA: 26 STEL: 39 (mg/m3) [Canada] TWA: 25 STEL: 37 (mg/m3) TWA: 10 STEL: 15 (ppm) from ACGIH (TLV) [United States] [1999] TWA: 10 (ppm) from OSHA (PEL) [United States] TWA: 25 (mg/m3) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

15.9 Physical and Chemical Properties

15.9.1 Physical state and appearance: Liquid.

15.9.2 Odor: Pungent. Vinegar-like. Sour

15.9.3 Taste: Sour. Vinegar

15.9.4 Molecular Weight: Not applicable.

15.9.5 Color: Violet. (Dark.)

15.9.6 pH (1% soln/water): Acidic.

15.9.7 Boiling Point: The lowest known value is 118.1°C (244.6°F) (Acetic acid).

15.9.8 Melting Point: May start to solidify at 16.6°C (61.9°F) based on data for: Acetic acid. **Critical Temperature:** The lowest known value is 321.67°C (611°F) (Acetic acid). **Specific Gravity:** The only known value is 1.049 (Water = 1) (Acetic acid).

15.9.9 Vapor Pressure: The highest known value is 1.5 kPa (@ 20°C) (Acetic acid). **Vapor Density:** The highest known value is 2.07 (Air = 1) (Acetic acid). **Volatility:** Not available.

15.9.10 Odor Threshold: The highest known value is 0.48 ppm (Acetic acid)

15.9.11 Water/Oil Dist. Coeff.: Not available.

15.9.12 Ionicity (in Water): Not available.

15.9.13 Dispersion Properties: See solubility in water, diethyl ether, acetone.

15.9.14 Solubility: Easily soluble in cold water, hot water. Soluble in diethyl ether, acetone. Miscible with Glycerol, alcohol, Benzene, Carbon Tetrachloride. Practically insoluble in Carbon Disulfide.

15.10 Stability and Reactivity Data

15.10.1 Stability: The product is stable.

15.10.2 Instability Temperature: Not available.

15.10.3 Conditions of Instability: Heat, ignition sources, incompatible materials

15.10.4 Incompatibility with various substances: Reactive with oxidizing agents, reducing agents, metals, acids, alkalis.

15.10.5 Corrosivity: Highly corrosive in presence of stainless steel(304). Slightly corrosive in presence of aluminum, of copper. Non-corrosive in presence of stainless steel(316).

15.10.6 Special Remarks on Reactivity: Reacts violently with strong oxidizing agents, acetaldehyde, and acetic anhydride. Material can react with metals, strong bases, amines, carbonates, hydroxides, phosphates, many oxides,cyanides, sulfides, chromic acid, nitric acid, hydrogen peroxide, carbonates. ammonium nitrate, ammonium thiosulfate, chlorine trifluoride, chlorosulfonic acid, perchloric acid, permanganates, xylene, oleum, potassium hydroxide, sodium hydroxide, phosphorus isocyanate, ethylenediamine, ethylene imine. (Acetic acid)

15.10.7 Special Remarks on Corrosivity: Moderate corrosive effect on bronze. No corrosion data on brass

15.10.8 Polymerization: Will not occur.

15.11 Toxicological Information

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

contact. Inhalation. Ingestion.

15.11.2 Toxicity to Animals: Acute oral toxicity (LD50): 3310 mg/kg [Rat]. (Acetic acid). Acute dermal toxicity (LD50): 1060 mg/kg [Rabbit]. (Acetic acid).

15.11.3 Chronic Effects on Humans: MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. [Acetic acid]. Mutagenic for bacteria and/or yeast. [Acetic acid]. Mutagenic for bacteria and/or yeast. [Gentian Violet]. Contains material which may cause damage to the following organs: kidneys, mucous membranes, skin, teeth.

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

15.11.5 Special Remarks on Toxicity to Animals: Not available.

15.11.6 Special Remarks on Chronic Effects on Humans: May affect genetic material and may cause reproductive effects based on animal data. No human data found. (Acetic acid)

15.11.7 Special Remarks on other Toxic Effects on Humans: Acute Potential Health Effects: Skin: Extremely irritating and corrosive. Causes skin irritation (reddening and itching, inflammation). May cause

blistering , tissue damage and burns. Eyes: Extremely irritating and corrosive. Causes eye irritation, lacrimation, redness, and pain. May cause burns, blurred vision, conjunctivitis, conjunctival and corneal destruction and permanent injury. Inhalation: Causes severe respiratory tract irritation. Affects the sense organs (nose, ear, eye, taste), and blood. May cause chemical pneumonitis, bronchitis, and pulmonary edema. Severe exposure may result in lung tissue damage and corrosion (ulceration) of the mucous membranes. Inhalation may also cause rhinitis, sneezing, coughing, oppressive feeling in the chest or chest pain, dyspnea, wheezing, tachypnea, cyanosis, salivation, nausea, giddiness, muscular weakness. Ingestion: Moderately toxic. Corrosive. Causes gastrointestinal tract irritation (burning and pain of the mouth, throat, and abdomen, coughing, ulceration, bleeding, nausea, abdomial spasms, vomiting, hematemesis, diarrhea. May Also affect the liver (impaired liver function), behavior (convulsions, giddines, muscular weakness), and the urinary system - kidneys (Hematuria, Albuminuria, Nephrosis, acute renal failure, acute tubular necrosis). May also cause dyspnea or asphyxia. May also lead to shock, coma and death. Chronic Potential Health Effects: Chronic exposure via ingestion may cause blackening or erosion of the teeth and jaw necrosis, pharyngitis, and gastritis. It may also behavior (similar to acute ingestion), and

metabolism (weight loss). Chronic exposure via inhalation may cause asthma and/or bronchitis with cough, phlegm, and/or shortness of breath . It may also affect the blood (decreased leukocyte count), and urinary system (kidneys). Repeated or prolonged skin contact may cause thickening, blackening, and cracking of the skin. (Acetic acid)

15.12 Ecological Information

15.12.1 Ecotoxicity: Not available. **BOD5 and COD:** Not available.

15.12.2 Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

15.12.3 Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the product itself.

15.12.4 Special Remarks on the Products of Biodegradation: Not available.

15.13 Disposal Considerations

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

15.14 Transport Information

15.14.1 DOT Classification: CLASS 3: Flammable liquid. Class 8: Corrosive material

15.14.2 Identification: : Acetic Acid, glacial (Acetic acid) UNNA: 2789 PG:

II

15.14.3 Special Provisions for Transport: Not available.

15.15 Other Regulatory Information

15.15.1 Federal and State Regulations: New York release reporting list: Acetic acid Rhode Island RTK hazardous substances: Acetic acid Pennsylvania RTK: Acetic acid Florida: Acetic acid Minnesota: Acetic acid Massachusetts RTK: Acetic acid New Jersey: Acetic acid California Director's List of Hazardous Materials: Acetic Acid TSCA 8(b) inventory: Acetic acid; Gentian Violet CERCLA: Hazardous substances.: Acetic acid: 5000 lbs. (2268 kg);

15.15.2 Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

15.15.3 Other Classifications: WHMIS (Canada): CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F). CLASS E: Corrosive liquid.

15.15.4 DSCL (EEC): mR10- Flammable. R35- Causes severe burns. S23- Do not breathe gas/fumes/vapour/spray S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

15.15.5 HMIS (U.S.A.):

15.15.5.1 Health Hazard: 3

15.15.5.2 Fire Hazard: 2

15.15.5.3 Reactivity: 0

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

15.15.6.1 Health: 3

15.15.6.2 Flammability: 2

15.15.6.3 Reactivity: 0

15.15.7 Specific hazard: Protective Equipment: Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

15.16 Other Information The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

16.0 Giemsa Stain MSDS

16.1 Chemical Product Identification

16.1.1 Product Name: Giemsa Stain

16.1.2 CAS#: 51811-82-6

16.1.3 RTECS: Not applicable.

16.1.4 Inventory: No products were found.

16.1.5 CI#: Not available.

16.1.6 Synonym:

16.1.7 Chemical Name: Not applicable.

16.1.8 Chemical Formula: Not applicable.

16.2 Composition and Information on Ingredients

16.2.1 Composition:

16.3 Hazards Identification

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

16.3.2 Potential Chronic Health Effects: Hazardous in case of ingestion. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of inhalation. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC

EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available.

16.4 First Aid Measures

16.4.1 Eye Contact: No known effect on eye contact, rinse with water for a few minutes.

16.4.2 Skin Contact: After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

16.4.3 Serious Skin Contact: Not available.

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

16.4.5 Serious Inhalation: Not available.

16.4.6 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. Seek immediate medical attention.

16.4.7 Serious Ingestion: Not available.

16.5 Fire and Explosion Data

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

16.5.2 Auto-Ignition Temperature: Not available.

16.5.3 Flash Points: Not available. **Flammable Limits:** Not available. **Products of Combustion:** Not available.

16.5.4 Fire Hazards in Presence of Various Substances: Not available.

16.5.5 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.

16.5.6 Fire Fighting Media and Instructions: SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

16.5.7 Special Remarks on Fire Hazards: Not available.

16.5.8 Special Remarks on Explosion Hazards: Not available.

16.6 Accidental Release Measures

16.6.1 Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and

regional authority requirements.

16.6.2 Large Spill: Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

16.7 Handling and Storage

16.7.1 Precautions: 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 breathe dust.

16.7.2 Storage: Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

16.8 Exposure Controls/Personal Protection

16.8.1 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.

16.8.2 Personal Protection: Safety glasses, Lab coat, Dust respirator and

Gloves. Be sure to use an approved/certified respirator or equivalent.

16.8.3 Personal Protection in Case of a Large Spill: Splash goggles, Full suit, Dust respirator, Boots and 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.

16.8.4 Exposure Limits: Not available.

16.9 Physical and Chemical Properties

16.9.1 Physical state and appearance: Solid.

16.9.2 Odor: Not available.

16.9.3 Taste: Not available.

16.9.4 Molecular Weight: Not applicable.

16.9.5 Color: Not available.

16.9.6 pH (1% soln/water): Not available. **Boiling Point:** Not available. **Melting Point:** 300°C (572°F)

16.9.7 Critical Temperature: Not available. **Specific Gravity:** Not available. **Vapor Pressure:** Not applicable. **Vapor Density:** Not available. **Volatility:** Not available.

16.9.8 Odor Threshold: Not available. **Water/Oil Dist. Coeff.:** Not available.

Ionicity (in Water): Not available. **Dispersion Properties:** Not available.

16.9.9 Solubility: Not available.

16.10 Stability and Reactivity Data

16.10.1 Stability: The product is stable. **Instability Temperature:** Not available. **Conditions of Instability:** Not available.

16.10.2 Incompatibility with various substances: Not available.

16.10.3 Corrosivity: Non-corrosive in presence of glass.

16.10.4 Special Remarks on Reactivity: Not available.

16.10.5 Special Remarks on Corrosivity: Not available.

16.10.6 Polymerization: No.

16.11 Toxicological Information

16.11.1 Routes of Entry: Ingestion.

16.11.2 Toxicity to Animals: LD50: Not available. LC50: Not available.

16.11.3 Chronic Effects on Humans: Not available.

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

16.11.5 Special Remarks on Toxicity to Animals: Not available.

16.11.6 Special Remarks on Chronic Effects on Humans: Not available.

16.11.7 Special Remarks on other Toxic Effects on Humans: Not available.

16.12 Ecological Information

16.12.1 Ecotoxicity: Not available. **BOD5 and COD:** Not available.

16.12.2 Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

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

16.12.4 Special Remarks on the Products of Biodegradation: Not available.

16.13 Disposal Considerations

16.13.1 Waste Disposal:

16.14 Transport Information

16.14.1 DOT Classification: Not a DOT controlled material (United States).

16.14.2 Identification: Not applicable.

16.14.3 Special Provisions for Transport: Not applicable.

16.15 Other Regulatory Information Federal and State Regulations: No products were found.

16.15.1 Other Classifications:

16.15.2 WHMIS (Canada): Not controlled under WHMIS (Canada).

16.15.3 DSCL (EEC): This product is not classified according to the EU regulations.

16.15.4 HMIS (U.S.A.):

16.15.4.1 Health Hazard: 1

16.15.4.2 Fire Hazard: 1

16.15.4.3 Reactivity: 0

16.15.4.4 Personal Protection: E

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

16.15.5.1 Health: 1

16.15.5.2 Flammability: 1

16.15.5.3 Reactivity: 0

16.15.6 Specific hazard: Protective Equipment: Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.

16.16 Other Information: The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their

own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.