Material Safety Data Sheets

The Mystery of Lyle and Louise

Blood Detection and Evidence Processing

This document contains material safety data sheets for the following kit items:

- **Ethyl Alcohol Denatured**
- **Hydrogen Peroxide**
- **Phenolphthalein**

Material Safety Data Sheet

Vandalia Science Education · 1111 Veterans Memorial Blvd · Huntington, WV 25701
Phone: 304-529-0803 · Fax 888-550-8220

Section 1 - Chemical Product and Company Identification

Name: Ethyl Alcohol Denatured
Common Synonyms: Alcohol; spirits of wine; potato alcohol; CDA Formula 19
Molecular Weight: Not applicable to mixtures.
Chemical Formula: Not applicable to mixtures.
Chemtrec Phone: 800-424-9300
National Response Center 800-424-8802

Product Use: Laboratory Reagent
Prepared by Stephanie Bexfield (June 2010)

Section 2 - Composition / Information on Ingredients

Ingredient	CAS No.	Percent
Ethyl Alcohol, denatured*	64-17-5	95%
Water	7732-18-5	5%

*Denaturants: Isopropyl alcohol (CAS No. 67-63-0), Methyl alcohol (CAS No. 67-56-1)

Section 3 - Hazard Identification

Emergency Overview
WARNING! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS THE CENTRAL NERVOUS SYSTEM, LIVER, KIDNEYS, BLOOD, AND REPRODUCTIVE SYSTEM.
Effects of overexposure:
Inhalation: Ethanol vapors can produce CNS depression, eye and upper respiratory tract irritation. Symptoms may include burning sensation, headache, dizziness, tremors, nausea and other symptoms similar to ingestion.
Ingestion: Dose-related central nervous system depression occurs, ranging from inebriation to anesthesia, narcosis, coma, respiratory failure, and death in significant exposures. Symptoms include headaches, tremors, fatigue, hallucinations, distorted perceptions, and convulsions.
Skin Contact: Contact may result in skin dryness with mild irritation and redness.
Eye Contact: Ethanol vapors irritate the eyes. Splashes cause burning and stinging sensation with watering of the eyes and reflex closure of the lids.
Chronic Exposure: Chronic ethanol exposure may affect the central nervous system, liver, blood and reproductive system. Examples of chronic effects include physical dependence, malnutrition, neurological effects (e.g., amnesia, dementia, prolonged sleepiness). Chronic ingestion has been associated with cancers of the esophagus and liver. Repeated or prolonged skin contact may result in drying of the skin and dermatitis. Combined exposure to ethanol and certain other chemicals may result in increased toxic effects. Prolonged exposure may affect the kidneys.
Aggravation of Pre-existing Conditions: Persons with pre-existing skin disorders, eye problems, liver disease, central nervous system disorders, or impaired respiratory function may be more susceptible to the effects of the substance.

Section 4 - First Aid Measures

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion: Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Section 5 - Fire-Fighting Measures

Fire:
Flash point: 13C (55F) CC
Autoignition temperature: 363C (685F)
Flammable limits in air % by volume:
lel: 3.3; uel: 19.0
Listed values are for pure ethanol. Flammable Liquid and Vapor!
Explosion: Sealed containers may rupture when heated. Above the flash point, explosive vapor-air mixtures may be formed. Vapor may explode if ignited in an enclosed area. Vapors can flow along surfaces to distant ignition source and flash back.
Fire Extinguishing Media: Most appropriate extinguishers are carbon dioxide and alcohol-resistant foam. Use water in flooding quantities as fog. Water spray may be used to keep fire exposed containers cool. Do not allow water runoff to enter sewers or waterways.
Special Information: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

Section 6 - Accidental Release Measures

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

Section 7 - Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Do Not attempt to clean empty containers since residue is difficult to remove. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death.

Section 8 - Exposure Controls / Personal Protection

Airborne Exposure Limits: For Ethyl Alcohol:
- OSHA Permissible Exposure Limit (PEL):
1,000 ppm (TWA)
- ACGIH Threshold Limit Value (TLV):
1,000 ppm (STEL), A3 - Confirmed animal carcinogen with unknown relevance to humans.
Ventilation System: A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved): If the exposure is limited, wear a supplied air, full-face piece respirator, air lined hood, or full-face piece self-contained breathing apparatus.
Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
Eye Protection: Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Section 9 - Physical and Chemical Properties

Appearance: Clear, colorless liquid.

Odor: Mild odor
Solubility: Infinitely soluble.
Specific Gravity: 0.80 @ 20C/4C
pH: No information found.
% Volatiles by volume @ 21C (70F): No information found
Boiling Point: 78C (172F)
Melting Point: < -114C (< -173F)
Vapor Density (Air=1): 1.6 @ 19C (66F)
Vapor Pressure (mm Hg): 47 @ 25C (77F)
Evaporation Rate (BuAc=1): ca. 3.3

Section 10 - Stability and Reactivity

Stability: Stable under ordinary conditions of use and storage. Rapidly absorbs water from air.
Hazardous Decomposition Products: Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization: Will not occur.
Incompatibilities: Ethyl Alcohol is incompatible with strong oxidizing agents, perchlorates, aluminum, alkali metals, acetyl chloride, calcium hypochlorite, chlorine oxides, mercuric nitrate, hydrogen peroxide, nitric acid, bromine pentafluoride, chromyl chloride, permanganic acid, uranium hexafluoride, acetyl bromide. Ingnites on contact with phosphorous (III) oxide; platinum; disulfuric acid + nitric acid; potassium tert-butoxide + acids. Will ignite and then explode on contact with acetic anhydride + sodium hydrogen sulfate. Forms explosive products in reaction with silver nitrate; ammonia + silver; silver (I) oxide + ammonia or hydrazine.
Conditions to Avoid: Heat, flames, ignition sources and incompatibles.

Section 11- Toxicological Information

Toxicological Data: For Ethyl Alcohol: LD50 oral rat 7060 mg/kg; LC50 inhalation rat 20,000 ppm/10H; Irritation skin rabbit, std Draize, 20 mg/24H, moderate; Irritation eye rabbit, std Draize, 500 mg/24H, mild. Investigated as a tumorigen, mutagen, reproductive effector.
Reproductive Toxicity: Ethanol has been linked to birth defects in humans. Ethanol crosses the placenta and can cause acute intoxication of the newborn or teratogenic effects, including fetal alcohol syndrome.

Section 12 - Ecological Information

Environmental Fate: Ethyl Alcohol Component
When released into the soil, this material may biodegrade to a moderate extent. When released into the soil, this material may leach into groundwater. When released into the soil, this material may evaporate to a moderate extent. When released into water, this material is expected to readily biodegrade. When released into water, this material may evaporate to a moderate extent. When released into the air, this material is expected to be readily degraded by photolysis.

Section 13 - Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

Section 14 - Transport Information

Domestic (Land, D.O.T.), International (Water, I.M.O., Air, I.C.A.O.)

Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. (ETHYL ALCOHOL)
Hazard Class: 3
UN/NA: UN1993
Packing Group: II
Information reported for product/size: 20L

Section 15 - Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Ethyl Alcohol (64-17-5)	Yes	Yes	Yes	Yes
Methyl Isobutyl Ketone (108-10-1)	Yes	Yes	Yes	Yes
Kerosene (8008-20-6)	Yes	Yes	No	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

		--Canada--		
Ingredient	Korea	DSL	NDSL	Phil.
Ethyl Alcohol (64-17-5)	Yes	Yes	No	Yes
Methyl Isobutyl Ketone (108-10-1)	Yes	Yes	No	Yes
Kerosene (8008-20-6)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

	-SARA 302-		------SARA 313------	
Ingredient	RQ	TPQ	List	Chemical Catg.
Ethyl Alcohol (64-17-5)	No	No	No	No
Methyl Isobutyl Ketone (108-10-1)	No	No	Yes	No
Kerosene (8008-20-6)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------------

		-RCRA-	-TSCA-
Ingredient	CERCLA	261.33	8(d)
Ethyl Alcohol (64-17-5)	No	No	No
Methyl Isobutyl Ketone (108-10-1)	5000	U161	No
Kerosene (8008-20-6)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Mixture / Liquid)

WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

Section 16 - Other Information

NFPA Ratings: Health: 2 Flammability: 3 Reactivity: 0
Label First Aid: If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

The above information has been developed based upon currently available scientific data. New information may be developed from time to time which may render the conclusions of this report obsolete. Therefore, no warranty is extended as to the applicability of this information to the user's intended purpose or for the consequences of its use or misuse. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. Vandalia Science Education, Inc. shall not be held liable for any damage resulting from handling or from contact with the above product.

Material Safety Data Sheet

Vandalia Science Education · 1111 Veterans Memorial Blvd · Huntington, WV 25701
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Section 1 - Chemical Product and Company Identification

Name: Hydrogen Dioxide Solution, 3%; Hydrogen Peroxide Topical Solution U.S.P

Formula: H_2O_2 in aqueous solution (3%)
Chemtrec Phone: 800-424-9300
National Response Center 800-424-8802

Product Use: Laboratory Reagent
Prepared by Stephanie Bexfield (June 2010)

Section 2 - Composition / Information on Ingredients

Ingredient	CAS No.	Percent
Hydrogen Peroxide	7722-84-1	2 – 4%
Water	7732-18-5	96 – 98%

Section 3 - Hazard Identification

Emergency Overview
Warning: May be harmful if swallowed. Causes eye irritation.
Effects of overexposure:
Eye contact: Causes irritation, redness, and pain
Skin contact: No adverse effects expected on intact skin. Contact on burn or open skin may cause stinging pain or irritation.
Inhalation: Not expected to be a health hazard under normal conditions.
Ingestion: Large oral doses may cause irritation and blistering to the mouth, throat, and abdomen. May also cause abdominal pain, vomiting, and diarrhea.
Chronic exposure: None known
Medical conditions aggravated by exposure: No information found.

Section 4 - First Aid Measures

Skin Contact: Not expected to require first aid measures. Wash exposed area with soap and water. Get medical advice if irritation develops.
Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.
Inhalation: Not expected to require first aid measures.
Ingestion: Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.

Section 5 - Fire-Fighting Measures

Fire: Not considered to be a fire hazard. Concentrated hydrogen peroxide (30%) is a strong oxidizer, but this dilute product does not present that hazard.
Explosion: Not considered to be an explosion hazard. Drying of concentrated hydrogen peroxide on clothing or other combustible materials may cause fire or explosion.
Extinguishing Media: Use any means suitable for extinguishing surrounding fire.
Special Information: Use protective clothing and breathing equipment appropriate for the surrounding fire.

Section 6 - Accidental Release Measures

Procedures: Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Small amounts of residue may be flushed to sewer with plenty of water.

Section 7 - Handling and Storage

Handling Procedures and Equipment: Store in a cool, well-ventilated dark area. Protect from freezing. Isolate from

incompatible substances. Protect container from physical damage. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

Section 8 - Exposure Controls / Personal Protection

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
1 ppm (TWA).
-ACGIH Threshold Limit Value (TLV):
1 ppm (TWA), A3: Animal carcinogen.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
Not expected to require personal respirator usage. If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. This substance has unknown warning properties.

Skin Protection:
Wear protective gloves and clean body-covering clothing.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Section 9 - Physical and Chemical Properties

Appearance: Clear, colorless solution.
Odor: Odorless.
Solubility: Infinitely soluble.
Specific Gravity: ca. 1.0
pH: No information found.
% Volatiles by volume @ 21C (70F): 100
Boiling Point: ca. 100C (ca. 212F)
Melting Point: ca. 0C (ca. 32F)
Vapor Density (Air=1): No information found.
Vapor Pressure (mm Hg): No information found.
Evaporation Rate (BuAc=1): No information found.

Section 10 - Stability and Reactivity

Stability: Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products: Decomposes to water and oxygen.
Hazardous Polymerization: Will not occur.
Incompatibilities: Heat, reducing agents, organic materials, dirt, alkalis, rust, and many metals.
Conditions to Avoid: Light, heat, incompatibles.

Section 11- Toxicological Information

May cause skin irritation. May be harmful if absorbed through the skin.
Causes eye irritation.
Harmful if swallowed. Material is irritating to mucous membranes and upper respiratory tract.
May be harmful if inhaled.

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

Dilute with water and flush to sewer if local ordinances allow, otherwise, whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or

contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

Section 14 - Transport Information

Proper Shipping Name (Domestic and International): Chemicals, NOS (non-regulated)
US Customs Number: 28332900006

Section 15 - Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Hydrogen Peroxide (7722-84-1)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

--Canada--

Ingredient	Korea	DSL	NDSL	Phil.
Hydrogen Peroxide (7722-84-1)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

-SARA 302- ------SARA 313------

Ingredient	RQ	TPQ	List	Chemical Catg.
Hydrogen Peroxide (7722-84-1)	No	No	No	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------------

-RCRA- -TSCA-

Ingredient	CERCLA	261.33	8(d)
Hydrogen Peroxide (7722-84-1)	No	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No
TSCA 12(b): No
CDTA: No SARA 311/312:
Acute: Yes
Chronic: No
Fire: No
Pressure: No
Reactivity: Yes (Mixture / Liquid)

Section 16 - Other Information

WHMIS: MSDS prepared according to hazard criteria of controlled products regulations (CPR) and MSDS contains all information required by CPR.

NFPA Ratings:
Health: 1
Flammability: 0
Reactivity: 1

The above information has been developed based upon currently available scientific data. New information may be developed from time to time which may render the conclusions of this report obsolete. Therefore, no warranty is extended as to the applicability of this information to the user's intended purpose or for the consequences of its use or misuse. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. Vandalia Science Education, Inc., shall not be held liable for any damage resulting from handling or from contact with the above product.

Material Safety Data Sheet

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Phone: 304-529-0803 · Fax 888-550-8220

Section 1 - Chemical Product and Company Identification

Name: Phenolphthalein Solution 1%
Common Synonyms: Phenolphthalein Indicator Solution
Formula: Not applicable to mixtures.
Molecular Weight: Not applicable to mixtures.
Chemtrec Phone: 800-424-9300
National Response Center 800-424-8802

Product Use: Laboratory Reagent
Prepared by Stephanie Bexfield (June 2010)

Section 2 - Composition / Information on Ingredients

Ingredient	CAS No.	Percent
Phenolphthalein	77-09-8	1%
Isopropyl alcohol	67-63-0	99%

Section 3 - Hazard Identification

Emergency Overview
Appearance: colorless liquid. Flash Point: 12 deg C.
Warning! Flammable liquid and vapor. Causes eye, skin, and respiratory tract irritation. May cause allergic skin reaction. May cause central nervous system depression. May cause cancer based on animal studies. May form explosive peroxides. May cause kidney damage. May cause reproductive and fetal effects.
Target Organs: Kidneys, central nervous system.
Potential Health Effects
Eye: Produces irritation, characterized by a burning sensation, redness, tearing, inflammation, and possible corneal injury.
Skin: May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Prolonged and/or repeated contact may cause defatting of the skin and dermatitis. May cause irritation with pain and stinging, especially if the skin is abraded.
Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause kidney damage. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure.
Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Inhalation of vapor may cause respiratory tract irritation.
Chronic: Possible cancer hazard based on tests with laboratory animals. Prolonged or repeated skin contact may cause defatting and dermatitis. May cause kidney injury. May cause allergic skin reaction in some individuals.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.
Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire-Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors can travel to a source of ignition and flash back. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. This chemical poses an explosion hazard. May form explosive peroxides. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.
Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Water may be ineffective. For large fires, use water spray, fog or alcohol-resistant foam. Do NOT use straight streams of water. Cool containers with flooding quantities of water until well after fire is out.
Flash Point: 12 deg C (53.60 deg F)
Autoignition Temperature: 398.9 deg C (750.02 deg F)
Explosion Limits, Lower:2.0
Upper: 12.7
NFPA Rating: (estimated) Health: 1; Flammability: 3; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Scoop up with a non-sparking tool, then place into a suitable container for disposal. Remove all sources of ignition. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.
Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Keep container closed when not in use. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
OSHA Vacated PELs: Isopropyl alcohol: 400 ppm TWA; 980 mg/m3 TWA Phenolphthalein: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Nitrile or Neoprene gloves are recommended.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: colorless
Odor: alcohol-like
pH: Not available.
Vapor Pressure: 40 mm Hg
Vapor Density: 2.1
Evaporation Rate:2.88 (Butyl Acetate=1)
Viscosity: Not available.

Boiling Point: 83 deg C
Freezing/Melting Point:-89 deg C
Decomposition Temperature: Not available.
Solubility: Soluble in water.
Specific Gravity/Density: 0.7855
Molecular Formula: Mixture
Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable. This material may be sensitive to peroxide formation.
Conditions to Avoid: This material may be sensitive to peroxide formation., incompatible materials, ignition sources, excess heat.
Incompatibilities with Other Materials: Oxidizing agents, Isopropanol is susceptible to autoxidation and therefore should be classified as peroxidizable..
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, acrid smoke and fumes.
Hazardous Polymerization: Will not occur.

Section 11- Toxicological Information

Epidemiology: The NTP reported that there was clear evidence of carcinogenic activity in male rats based on the markedly increased incidences of benign pheochromocytoma of the adrenal medulla and others. There was clear evidence in mice based on the increased incidences of histiocytic sarcoma and malignant lymphoma of thymic origin. There was also clear evidence in female mice based on the increased incidences of histiocytic sarcoma, malignant lymphomas, and benign sex-cord stromal tumors of the ovary.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: Significant increases in chromosomal aberrations were observed after treatment of cultured Chinese hamster ovary cells with phenolphthalein in the presence of S9. Frequencies of micronucleated erythrocytes were noted in male and female feeding studies.
Neurotoxicity: No information available.

Section 12 - Ecological Information

Ecotoxicity: No data available. Cas# 67-63-0:LC50 (96Hr.) Fathead Minnow = 94900-10400 mg/L; Flow-through conditionLC50 (96 Hr.) Fathead Minnow = 61200-65500 mg/L;Flow-through condition.
Environmental: Cas# 67-63-0: TERRESTRIAL FATE: When spilled on soil, isopropanol will both evaporate quickly and leach into the ground due to its high vapor pressure and low adsorption to soil. Degradation in soil and groundwater has not been determined. If soil degradation is not rapid, it is apt to leach into the groundwater. AQUATIC FATE: When released into water, isopropyl alcohol will volatilize (estimated half-life approximately 5.4 days) and may biodegrade. Although it is readily degradable in a number of laboratory tests, no data on its degradability in natural waters.
Physical: Cas# 67-63-0: ATMOSPHERIC FATE: When released into the atmosphere, isopropanol will photodegrade with an estimated half-life ranging from one to several days. Due to its solubility in water, rainout may be significant.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

Proper Shipping Name (Domestic and International): Isopropanol
Shipping Class: 3
UN Number: UN1219
Packing Group: II

Section 15 - Regulatory Information

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 67-63-0: immediate, delayed, fire.

CAS # 77-09-8: immediate.

Section 313

This material contains Isopropyl alcohol (CAS# 67-63-0, 99%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

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.

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.

OSHA:

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

STATE

CAS# 67-63-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 77-09-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: F

Risk Phrases: R 11 Highly flammable.

Safety Phrases: S 16 Keep away from sources of ignition - No smoking., S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection): CAS# 67-63-0: 1, CAS# 77-09-8: 1

Canada - DSL/NDSL: CAS# 67-63-0 is listed on Canada's DSL List., CAS# 77-09-8 is listed on Canada's DSL List.

Canada – WHMIS: This product has a WHMIS classification of B2, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List: CAS# 67-63-0 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Other Information

WHMIS: MSDS prepared according to hazard criteria of controlled products regulations (CPR) and MSDS contains all information required by CPR.

The above information has been developed based upon currently available scientific data. New information may be developed from time to time which may render the conclusions of this report obsolete. Therefore, no warranty is extended as to the applicability of this information to the user's intended purpose or for the consequences of its use or misuse. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. Vandalia Science Education, Inc., shall not be held liable for any damage resulting from handling or from contact with the above product.