SECTION 12- HAZARD COMMUNICATION PROGRAM (HCP)

29 CFR Section 1920- “Hazardous Communications” states that, “the purpose of this section is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training.’ The Louisiana State Office of Risk Management policies follow this standard.

SECTION 13 OF THIS SAFETY PLAN, “THE CHEMICAL HYGIENE PLAN”, AND SECTION 14, “LABORATORY SAFETY MANUAL” ARE TO BE USED IN CONJUNCTION WITH THE HCP WHEN PURCHASING, STORING, USING AND DISPOSING OF CHEMICALS.

HAZARDS ASSOCIATED WITH BIOLOGICAL AND RADIOLOGICAL AGENTS ARE NOT PART OF THE HCP. A DESCRIPTION OF BIOLOGICAL AND RADIOLOGICAL HAZARDS AND WAYS TO MINIMIZE THEM ARE FOUND IN “APPENDIX C- LABORATORY SAFETY MANUAL”

RESPONSIBILITIES FOR THE HCP

(Note: The University President is ultimately responsible for the overall direction of the campus safety and risk management programs, but has delegated certain of these responsibilities to other levels of authority at the University. Principal among these are the Budget Unit Heads.)

Budget Unit Heads, Managers, and Supervisors shall:

1. Comply with and be responsible for the management of the Hazardous Communication and Chemical Hygiene/Safety Program in their unit.

2. Maintain a list of all chemicals located in their unit, by name, CAS #, location by room number, amount on hand, amount purchased since last inventory, amount disposed of since last inventory. A copy of this inventory must be submitted to the Office of Environmental Health and Safety, each year.

3. Have all employees in the Unit practice chemical minimization procedures that will limit the amount of chemical (s) to only those minimal amounts necessary to do the job.

4. Obtain and provide Material Safety Data Sheets (MSDS) for all chemicals in their Unit and have them available in the area(s) where the chemicals are used.

5. Conduct documented quarterly inspections of each worksites in which chemicals are used and have these inspections on file for review by local, State, and federal oversight agencies.

6. Ensure that necessary physical or toxic warning signs are posted in those areas where special notices are required.
7. Ensure that all hazards are identified in both routine and non-routine operational protocols (ex: Lab procedures, JSAs).

8. Ensure that employees and students wear the appropriate personal protective equipment when working with hazardous chemicals or other hazards. These PPEs are to be provided by the Budget Unit Head.

9. Ensure that warning signs are posted in each work area that requires the use of specific personal protective equipment (PPE) to protect employees or students. Department Heads/Supervisors shall make appropriate personal protective equipment available as needed.

10. Notify any Custodial, Trades, or contractor personnel, in writing, of the chemical and other hazards they may encounter in any area within the Budget Unit and provide them with the necessary MSDSs, before these other personnel enter any of these areas.

11. Provide appropriate and on-going documented training of their employees regarding the safety handling and use of chemicals the location and operation of controls, procedures used to protect themselves and other workers, emergency plans, and location of MSDS. This training can be accomplished in a Unit safety meeting. A sample outline for such training is included in this Section.

A more extensive list of responsibilities for Budget Unit Heads of areas which have laboratories is found in the Section 14- Laboratory Safety Manual.

Faculty and Staff shall:

1. Be responsible for become informed about the chemical and physical hazards of their workplace and how to protect themselves, students, and other employees from these hazards.

2. Shall be aware of the location and content of the Louisiana Tech University's Hazard Communication Program, the "Act", applicable MSDSs, safety rules governing the use of chemicals that are found in the Laboratory Safety Manual, JSAs, or other portions of the Safety Manual, those "site-specific" rules which govern specialty research/teaching labs and where lists of chemicals and information are located for their review.

3. Employees shall inform their supervisors of changes in operations that could affect the safety and health of the job site or work area.

4. In conjunction with the Budget Unit Head, be responsible for providing documented training of students and other persons who work with chemicals in their classes or other assigned work areas.

5. Ensure that each container of a chemical is labeled according to its MSDS and to applicable regulations.

6. Provide the Budget Unit Head with a list of any chemical they purchase at the time of the purchase.

A more extensive list of responsibilities for faculty and staff of areas which have laboratories is found in the Section 14- Laboratory Safety Manual.
Contractors and Supervisors of Trades and Custodial personnel shall:

1. Comply with the applicable federal and State Hazardous Communication Standards when working on campus.

2. Oversee the work of their employees to ensure that they are properly using and disposing of chemical they are using in their jobs.

3. Properly dispose of any hazardous chemicals, including asbestos, that they remove in their job on campus.

4. Notify the Budget Unit Head over any area in which they are planning to work to determine if there are any hazards in these work areas and ways to protect their employees while they are in these areas.

5. Provide the MSDS for any chemicals they may be using in these areas to the Budget Unit Head so they can inform their employees of these hazards and take whatever steps that are necessary to protect them.

The Office of Environmental Health and Safety shall:

1. Establishment of an MSDS library to be housed in the Environmental Health and Safety office.

2. Provide training information to Budget Unit Heads when requested.

3. Consolidate all chemical inventories provided by all Budget Units into a single data base.

4. Provide any hazardous communication documentations to regulatory agencies, as needed.

5. Assist Budget Unit Heads and other administrator in the management of the Hazardous Communication Program.

COMPONENTS OF THE HCP

This Program consists of:

1. Maintaining a Hazardous Chemical Inventory

2. Maintaining MSDSs for Listed Chemicals

3. Product Labeling

4. Employee/Student Training
HAZARDOUS CHEMICAL INVENTORY - GENERAL REQUIREMENTS

1. Every hazardous chemical must be inventoried. A “hazardous chemical” is defined as: “any chemical that is designated as a hazard in the accompanying MSDS, or if the chemical is deemed a hazard on the product label, or if the chemical will burn, corrode, explode, or otherwise injure an employee if used improperly be an employee”.

2. Agents to be excluded from the chemical inventory are: (a) hazardous waste; (b) wood or wood products (if not burned as part of normal work); (c) tobacco; (d) food, drugs or cosmetics that are intended for personal consumption; ionizing/radiation hazards unless the radionuclide is in a chemical form that is hazardous in its non-radioactive form; and biological agents. Note: The listing and control of Biological Agents and Radiological Agents are required in other sections of the Safety Plan.

3. The inventory must be conducted by the Budget Unit Head or their designee each year and must be updated at any time during the year if new chemicals are purchased by the Unit or are disposed of using the proper disposal procedures. (See the Chemical Disposal Procedures in Section 13 of this Plan.

4. The inventory include:

(a) Name of the Budget Unit;
(b) Name of person conducting the inventory;
(c) date of Inventory (Note: Inventories are due in the Office of Environmental Health and Safety on July 1st of each calendar year)
(d) name of each chemical;
(e) CAS # of each, if available;
(f) physical state of each chemical
(g) amount of each chemical on hand at time of inventory;
(h) location of each chemical, by Building Name and Room #;
(i) PPE(s) required to handle each chemical

NOTE: MANUFACTURERS ARE REQUIRED TO PUT EXPIRATION DATES ON MOST CHEMICALS. CHECK THE EXPIRATION DATES WHEN CONDUCTING THE INVENTORY AND DISPOSE OF ANY OUTDATED CHEMICALS. ALSO DISPOSE OF ANY CHEMICALS THAT APPEAR CONTAMINATED OR DEGRADED. THE MSDS FOR SUCH CHEMICALS LISTS THE EXPECTED APPEARANCE OF THAT CHEMICAL. IF THE CHEMICAL’S APPEARANCE DOESN’T MEET THESE SPECIFICATIONS, DISCARD IT. OFTEN DEGRADATION PRODUCTS OF A CHEMICAL CAN BE MORE DANGEROUS THAN THE PARENT CHEMICAL!
MATERIAL SAFETY DATA SHEETS (MSDS), INCLUDING THE USE OF ELECTRONIC DATA BASES

General Requirements

1. Access to MSDSs for all hazardous chemical must be available in the work areas where the chemical is used at all times.

NOTE:

BUDGET UNITS MAY CHOOSE TO USE AN ELECTRONIC DATA BASE TO ACCESS MSDSs. SHOULD THEY CHOOSE THIS OPTION, THE FOLLOWING MUST BE IN THE WORK AREA WHERE THE CHEMICALS ARE BEING STORED OR USED: (a) A FUNCTIONAL COMPUTER WITH THE SOFTWARE NECESSARY TO ACCESS THE MSDSs; (b) STEP-BY-STEP INSTRUCTIONS POSTED ON EACH COMPUTER, DESCRIBING HOW TO ACCESS THE MSDS.

2. The recommended format for a MSDS, according to OSHS is:

OSHA’s Hazard Communication Standard (HCS) specifies certain information that must be included on MSDSs, but does not require that any particular format be followed in presenting this information. In order to promote consistent presentation of information, OSHA recommends that MSDSs follow the 16-section format established by the American National Standards Institute (ANSI) standard for preparation of MSDSs.

By following this recommended format, the information of greatest concern to workers is featured at the beginning of the data sheet, including information on chemical composition and first aid measures. More technical information that addresses topics such as the physical and chemical properties of the material and toxicological data appears later in the document. While some of this information (such as ecological information) is not required by the HCS, the 16-section MSDS is becoming the international norm. The 16 sections are:

- Identification
- Hazard(s) identification
- Composition/information on ingredients
- First-aid measures
- Fire-fighting measures
- Accidental release measures
- Handling and storage
- Exposure controls/personal protection
- Physical and chemical properties
- Stability and reactivity
- Toxicological information
- Ecological information
- Disposal considerations
- Transport information
- Regulatory information
- Other information
In 1985, OSHA established a voluntary format for MSDSs to assist manufacturers and importers who desired guidance on organizing MSDS information. When completed correctly, an MSDS prepared using Form 174 contains all of the information required by OSHA. However, Form 174 does not use the more organized and comprehensive 16-section format.

OSHA believes that use of a consistent format will improve the effectiveness of MSDSs by making information easier for the reader to find, regardless of the supplier of the MSDS. Because the 16-section format is accepted by consensus as the most appropriate format, OSHA no longer endorses that Form 174 be used for the preparation of MSDSs. Use of Form 174, however, is still acceptable under the HCS if it is completed correctly."

Example of a MSDS:

Material Safety Data Sheet

Sulfuric acid 90-98%

ACC# 22350

Section 1 - Chemical Product and Company Identification

**MSDS Name:** Sulfuric acid 90-98%

**Synonyms:** Hydrogen sulfate; Oil of vitriol; Vitriol brown oil; Mattling acid; Battery acid; Sulphuric acid; Electrolyte acid; Dihydrogen sulfate; Spirit of sulfur; Chamber acid.

**Company Identification:**
Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410
For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Chemical Name</th>
<th>Percent</th>
<th>EINECS/ELINCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7664-93-9</td>
<td>Sulfuric acid</td>
<td>90-98</td>
<td>231-639-5</td>
</tr>
</tbody>
</table>
Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear colorless to yellow liquid.  
**Danger!** Causes eye and skin burns. Causes digestive and respiratory tract burns. May be fatal if mist inhaled. Strong inorganic acid mists containing sulfuric acid may cause cancer. Concentrated sulfuric acid reacts violently with water and many other substances under certain conditions. May cause lung damage. Hygroscopic (absorbs moisture from the air). Corrosive to metal.  
**Target Organs:** Lungs, teeth, eyes, skin.

**Potential Health Effects**

**Eye:** Causes severe eye burns. May cause irreversible eye injury. May cause blindness. May cause permanent corneal opacification. The severity of injury depends on the concentration of the solution and the duration of exposure.

**Skin:** Causes skin burns. The severity of injury depends on the concentration of the solution and the duration of exposure.

**Ingestion:** May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns.

**Inhalation:** May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema. Causes chemical burns to the respiratory tract. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Because its vapor pressure is negligible, it exists in the air only as a mist or spray. Exposure may impair lung function and cause mucostasis (reduced mucous clearance).

**Chronic:** Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated inhalation may cause nosebleeds, nasal congestion, erosion of the teeth, perforation of the nasal septum, chest pain and bronchitis. Prolonged or repeated eye contact may cause conjunctivitis. Effects may be delayed. Workers chronically exposed to sulfuric acid mists may show various lesions of the skin, tracheobronchitis, stomatitis, conjunctivitis, or gastritis. Occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic to humans.

Section 4 - First Aid Measures

**Eyes:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

**Skin:** In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

**Ingestion:** If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.
Inhalation: POISON material. If inhaled, get medical aid immediately. Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Monitor arterial blood gases, chest x-ray, and pulmonary function tests if respiratory tract irritation or respiratory depression is evident. Treat dermal irritation or burns with standard topical therapy. Effects may be delayed. Do NOT use sodium bicarbonate in an attempt to neutralize the acid.

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. Use water spray to keep fire-exposed containers cool. Substance is noncombustible. Contact with water can cause violent liberation of heat and splattering of the material. Contact with metals may evolve flammable hydrogen gas. Runoff from fire control or dilution water may cause pollution. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Strong dehydrating agent, which may cause ignition of finely divided materials on contact. Oxides of sulfur may be produced in fire.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire. Do NOT get water inside containers. If water is used, care should be taken, since it can generate heat and cause spattering if applied directly to sulfuric acid.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 2; Special Hazard: -W-

Section 6 - Accidental Release Measures

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

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Carefully scoop up and place into appropriate disposal container. Provide ventilation. Do not get water inside containers. Cover with dry earth, dry sand, or other non-combustible material followed with plastic sheet to minimize spreading and contact with water.

Section 7 - Handling and Storage

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Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not allow water to get into the container because of violent reaction. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Discard contaminated shoes. Use only with adequate ventilation. Do not breathe spray or mist. Do not use with metal spatula or other metal items. Inform laundry personnel of contaminant's hazards.

Storage: Do not store near combustible materials. Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not store near alkaline substances. Store protected from moisture. Ideally, sulfuric acid should be stored in isolation from all other chemicals in an approved acid or corrosives safety cabinet.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Use a corrosion-resistant ventilation system.

Exposure Limits

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA - Final PELs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid</td>
<td>0.2 mg/m3 TWA (thoracic fraction)</td>
<td>1 mg/m3 TWA 15 mg/m3 IDLH</td>
<td>1 mg/m3 TWA</td>
</tr>
</tbody>
</table>

OSHA Vacated PELs: Sulfuric acid: 1 mg/m3 TWA

Personal Protective Equipment

Eyes: Wear chemical splash goggles and face shield.
Skin: Wear neoprene gloves, apron, and/or clothing. Viton 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: oily - clear colorless to yellow
Odor: odorless
pH: 0.3 (1N solution)
Vapor Pressure: < 0.001 mm Hg @ 20 deg C
Vapor Density: 3.38 (air=1)
Evaporation Rate: Slower than ether.
Viscosity: 21 mPas @ 25 C
Boiling Point: 290 - 338 deg C
Freezing/Melting Point: 10 deg C
Decomposition Temperature: 340 deg C
Solubility: Soluble with much heat
Specific Gravity/Density: 1.84
Molecular Formula: H2SO4
Molecular Weight: 98.07

Section 10 - Stability and Reactivity

Chemical Stability: Sulfuric acid reacts vigorously, violently or explosively with many organic and inorganic chemicals and with water.
Conditions to Avoid: Excess heat, exposure to moist air or water, Note: Use great caution in mixing with water due to heat evolution that causes explosive spattering. Always add the acid to water, never the reverse.
Incompatibilities with Other Materials: Metals, oxidizing agents, reducing agents, bases, acrylonitrile, chlorates, finely powdered metals, nitrates, perchlorates, permanganates, epichlorohydrin, aniline, carbides, fulminates, picrates, organic materials, flammable liquids.
Hazardous Decomposition Products: Oxides of sulfur.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7664-93-9: WS5600000
LD50/LC50:
CAS# 7664-93-9:
  Draize test, rabbit, eye: 250 ug Severe;
  Inhalation, mouse: LC50 = 320 mg/m3/2H;
  Inhalation, mouse: LC50 = 320 mg/m3;
  Inhalation, rat: LC50 = 510 mg/m3/2H;
  Inhalation, rat: LC50 = 510 mg/m3;
  Oral, rat: LD50 = 2140 mg/kg;
Carcinogenicity:
CAS# 7664-93-9:
- **ACGIH**: A2 - Suspected Human Carcinogen (contained in strong inorganic acid mists)
- **California**: carcinogen, initial date 3/14/03 (listed as Strong inorganic acid mists containing sulfuric acid).
- **NTP**: Known carcinogen (listed as Strong inorganic acid mists containing s).
- **IARC**: Group 1 carcinogen

Epidemiology: Workers exposed to industrial sulfuric acid mist showed a statistical increase in laryngeal cancer. This suggests a possible relationship between carcinogenesis and inhalation of sulfuric acid mist.

Teratogenicity: Sulfuric acid was not teratogenic in mice and rabbits, but was slightly embryotoxic in rabbits (a minor, rare skeletal variation). The animals were exposed to 5 and 20 mg/m3 for 7 hr/day throughout pregnancy. Slight maternal toxicity was present at the highest dose in both species.

Reproductive Effects: No information found

Mutagenicity: There are no mutagenicity studies specifically of sulfuric acid. However, there are established effects of reduced pH in mutagenicity testing, as would be caused by sulfuric acid. These effects are an artifact of low pH and are not necessarily due to biological effects of sulfuric acid itself.

Neurotoxicity: No information found

Other Studies:

Ecotoxicity: Fish: Bluegill/Sunfish: 49 mg/L; 48Hr; TLm (tap water @ 20C)
Fish: Bluegill/Sunfish: 24.5 ppm; 48Hr; TLm (fresh water)

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

<table>
<thead>
<tr>
<th></th>
<th>US DOT</th>
<th>Canada TDG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipping Name</td>
<td>SULFURIC ACID</td>
<td>SULFURIC ACID</td>
</tr>
<tr>
<td>Hazard Class</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>UN Number</td>
<td>UN1830</td>
<td>UN1830</td>
</tr>
<tr>
<td>Packing Group</td>
<td>II</td>
<td>II</td>
</tr>
</tbody>
</table>

Section 15 - Regulatory Information

US FEDERAL

**TSCA**
CAS# 7664-93-9 is listed on the TSCA inventory.

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

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

**Section 12b**
None of the chemicals are listed under TSCA Section 12b.

**TSCA Significant New Use Rule**
None of the chemicals in this material have a SNUR under TSCA.

**CERCLA Hazardous Substances and corresponding RQs**
CAS# 7664-93-9: 1000 lb final RQ; 454 kg final RQ

**SARA Section 302 Extremely Hazardous Substances**
CAS# 7664-93-9: 1000 lb TPQ

**SARA Codes**
CAS # 7664-93-9: immediate, delayed, reactive.

**Section 313**
This material contains Sulfuric acid (CAS# 7664-93-9, 90-98%), 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:**
CAS# 7664-93-9 is listed as a Hazardous Substance 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# 7664-93-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

**California Prop 65**
The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:
WARNING: This product contains Sulfuric acid, listed as ‘Strong inorganic acid mists contain’, a chemical known to the state of California to cause cancer.
California No Significant Risk Level: None of the chemicals in this product are listed.

**European/International Regulations**
**European Labeling in Accordance with EC Directives**

**Hazard Symbols:**
C

**Risk Phrases:**
R 35 Causes severe burns.

**Safety Phrases:**
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 30 Never add water to this product.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**WGK (Water Danger/Protection)**
CAS# 7664-93-9: 2

**Canada - DSL/NDSL**
CAS# 7664-93-9 is listed on Canada's DSL List.

**Canada - WHMIS**
This product has a WHMIS classification of D2A, D1A, E.
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# 7664-93-9 is listed on the Canadian Ingredient Disclosure List.
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 Fisher 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 Fisher has been advised of the possibility of such damages.

**LABELING OF CHEMICALS**

**General Information**

1. The manufacturer's label shall be legible, in English, not be removed from the container.

2. Any secondary container(s) into which a hazardous chemical is transferred from its original container must be labeled with the name of the chemical and the hazard warnings (example of hazard warning labels are listed below) that are on the original container. The exception to this rule is when an employee is to use the chemical immediately after the transfer and the secondary container(s) never leaves the possession of the employee.

3. Inert chemicals, such as containers of water should be labeled as to content, so as to not be confused with hazardous chemicals that have the same appearance.

4. Chemical mixtures such as Grignard reagent should be labeled with the common name for the mixture, if available, with the names of the reactants in the mixture and with any hazard labels that are appropriate to the mixture. Mixtures should also be labeled with the expiration date for the chemical.
THE NFPA HAZARD IDENTIFICATION SYSTEM LABELLING SYSTEM

Numerical rating from 0-4 with the hazards becoming more extreme as they are upscaled.

Health-Blue

4 - A few whiffs of the gas or vapor could cause death; liquid penetration could be fatal.
3 - Material is extremely dangerous, but area may be entered if fully protected.
2 - Material hazardous to health, but area may be entered freely if SCBA is used.
1 - Material is only slightly hazardous to health.
0 - Material offers no health hazards.

Flammability-Red

4 - Very flammable gases and very volatile flammable liquids and materials in the form of dusts or mists readily form explosive mixtures when dispersed into the air.
3 - Liquids which can be ignited under almost all normal temperatures (low flashpoint); solids which form dusts, solids in shredded or fibrous form; solids that burn rapidly because they create their own oxygen; any material that ignites spontaneously at normal temperature.
2 - Liquids which must be moderately heated before ignition will occur and solids that readily give off flammable vapors. (Usually, water can cool them off.)
1 - Materials that must be preheated before ignition can occur.
0 - Materials that will not burn.

Reactivity-Yellow

4 - Materials which, in themselves, are readily capable of detonation or explosive decomposition at normal temperatures. This includes materials sensitive to mechanical or thermal shock.
3-Materials which, in themselves, are capable of detonation or explosive decomposition, but require a strong initiation source or must be heated before initiation under confinement. Includes materials that are shock sensitive at elevated temperatures or pressures. (May react with water.)

2-Materials which, in themselves, are normally unstable and readily undergo violent chemical change but do not detonate. Includes materials that can undergo chemical change with rapid release of energy at normal temperatures or pressures. (May react with water.)

1-Materials which, in themselves, are normally stable, but may become unstable at elevated pressures and temperatures. May react with water but not violently.

0-Materials that are stable even under fire conditions and are not reactive with water.

Colorless

Special reactive materials such as:

- OXY Oxidizers
- Radiation
- W Water Reactive

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM (HMIS) FOR LABELING CHEMICALS

This system meets the Hazardous Communication Standard requirements by providing a format for hazard determinations, offering a basic written hazard communication program, and simplifying the employee training and information process. HMIS provides clear, recognizable information to employees by standardizing the presentation of chemical information. This is accomplished by the use of color codes corresponding to the hazards of a product, assigned numeric ratings indicating the degree of hazard, and alphabetical codes designating appropriate personal protective equipment (PPE) employees should wear while handling the material.

In many respects, the HMIS is very similar to the NFPA. The color and number coding are identical. But instead of the diamond (which many feared would be confused with the placarding system used by the US Department of Transportation. The HMIS uses a color bar system.

This system was developed by the National Paint and Coating Association and address situations more common to their environment than the situations encountered by firefighters. With this system, the white section is used to indicate what level of protective equipment is required. Instead of a hazard ranking, a
level of protection is indicated by a letter, with each letter specifying a different level of protection. Examples are:

A     safety glasses
B     safety glasses and gloves
C     safety glasses, gloves and an apron
D     face shield, gloves and an apron
E     safety glasses, gloves and a dust respirator
F     safety glasses, gloves, apron and a dust respirator
G     safety glasses, a vapor respirator
H     splash goggles, gloves, apron and a vapor respirator
I     safety glasses, gloves and a dust/vapor respirator
J     splash goggles, gloves, apron and a dust/vapor respirator
K     airline hood or mask, gloves, full suit and boots
L - Z  custom PPE specified by employer

This lettering system indicates the level of PPE to be worn to work safely with a material. The original system traditionally provided letters of the alphabet corresponding to a specific grouping of PPE. However, this did not allow employers to customize their PPE recommendations. Now employers who cannot find an appropriate grouping of PPE will be able to design their own custom set of equipment. Each of the individual PPE icons have been designated with a corresponding letter of the alphabet ranging from ‘m’ through ‘z’. An employer can list appropriate letters to customize the PPE required for handling a specific material. To facilitate this option, container labels have been revised to allow room for the additional codes in the PPE block of the label. Of course, employers who found the previous PPE groupings suitable for their work places can continue to use the standard codes.

OTHER LABELING FORMATS

Budget unit heads may elect to use different chemical labeling formats in addition to the NFPA or HMIS formats. Such labels must be permanently affixed to the chemical container. It is encouraged to place posters at various points, i.e. labs. conference rooms, breakrooms, etc., which indicate the types of hazards that may be encountered in a location, copies of the Hazard Communication Standard, the Hazard Communication Program, and where additional information may be obtained.
EMPLOYEE TRAINING, AS PART OF THE HCP

General Requirements

1. Budget unit Heads or their designees must conduct documented annual training /re-training on the HCPA or when an employee is re-assigned to an area where hazardous chemical are used. They must also re-train employees on the hazards of any new chemicals are introduced in the workplace, prior to the employee using them. See Section 1- for information on “Employee Training”.

2. Instructors or principal investigators must include documented HCP training of students on the hazards of any chemicals that students as part of the safety training they do for students.

ITEMS TO INCLUDE IN HCP TRAINING

1. Methods that may be used to detect the presence of a chemical or material are by visual appearance, odor, and irritation (skin, headaches, coughing).
2. Physical and health hazards of the chemicals or materials in the workplace and all information on the MSDS that may affect employees.
3. Measures used to protect the employee (Engineering design, barriers, ventilation, operating procedures, special training, etc.).
4. Details of the Hazard Communication Program.

SAMPLE TRAINING OUTLINE

I. Objectives:
   A. To ensure employees are made aware of the danger of hazardous chemicals in the workplace.
   B. To ensure employee are made aware of how such chemicals affect his/her body.
   C. To ensure employees learn how to recognize through labeling, the hazard category
   D. To ensure employee learn to interpret the Material Safety Data Sheet (MSDS).
   E. To ensure employees learn how to protect himself/herself from hazardous chemicals.

II. Modes of Entry Into the Body:
   A. Inhalation- Breathing
   B. Ingestion--Entering through the mouth
   C. Absorption--Contact with exposed body areas
D. Contact--As above (Corrosives)
   1. Once in the body, many materials/chemicals attack vital organs.
   2. Attack can be long or short term, but the results can be the same.

III. Effects:
   A. Carcinogenic--Cancer
   B. Toxic--Poison the organs
   C. Flammable--Burns
   D. Reactive--Explosion, burns, or toxic fumes leading to injury or death
   E. Cryogenic--Freezing or frostbite of body parts
   F. Corrosive--Destruction of human tissue
   G. Mutagenic--Damage to reproductive processes and fetus

III. Recognizing the Hazard:
   A. The NFPA Hazard Identification System
   B. The HMIS Identification System
   C. Product labelling by manufacturer
      1. Display of labels and signs

IV. Material Safety Data Sheets:

V. Review

**DEFINITIONS ASSOCIATED WITH THE HCP**

**Flammable solvents (liquid)**

A flammable solvent is an organic liquid whose vapor can form an ignitable mixture with air. The solvent vapor is the fuel. The oxidizer is the surrounding atmosphere. For the mixture to burn, an ignition source must be present.
Reactive Chemicals

Reactive chemicals are substances which, under certain ambient or induced conditions, enter into violent reactions with spontaneous generation of large quantities of heat, light, gases, or toxins that can be destructive to life and property.

Radioactive Chemicals

Radioactive chemicals are those which possess one or more constituent atoms capable of spontaneously emitting alpha, beta, or gamma rays by disintegration of the corresponding atomic nuclei (when removed from shielding, the body can be bombarded by the rays).

Corrosive Chemicals

Corrosive chemicals are those substances that by direct chemical action are injurious to body tissue. Corrosive injury may be of a minor degree (irritation) or of actual physical disruption of body tissues.

Toxic Chemicals

A toxic substance has the potential of injury by direct chemical action with body systems. Almost any substance is toxic when taken in excess. Toxic substances interfere with the function of cells in body tissues, i.e., direct physicochemical corrosion or subtle chemical reaction disrupting biological processes.

Biohazards

Biological hazards include insects, molds, fungi, and bacterial contamination stemming from items such as water, sewage, and food.

Compressed Gases

A compressed gas is any material in a container under pressure. Compressed gas cylinders contain a large amount of energy which, if released improperly, can result in serious injury. These gases can be toxic, flammable, or corrosive.

Cryogenic Liquids

Cryogenic liquids and compressed gases have many properties in common, hence many common hazards exists. Freezing or frostbite of tissue is a common hazard related to the use of cryogens.