



CHEMICAL HYGIENE PLAN: POLICIES AND PROCEDURES REGARDING WORK IN LABORATORIES

Springfield Technical Community College
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1.0 SPRINGFIELD TECHNICAL COMMUNITY COLLEGE COMMITMENT TO SAFETY

Springfield Technical Community College (STCC) strives to provide a safe and healthy work environment. Commitment to health and safety is the responsibility of individuals at all levels to protect the safety and health of all employees and the environment.

1.1 Purpose

The purpose of the Chemical Hygiene Plan (CHP) is to provide guidance to Springfield Technical Community College employees for working safely in the laboratory environment. The CHP describes proper laboratory practices, procedures, protective equipment, and hazard identification defined by best practices. The CHP is available on the STCC Department of Public Safety website, in the office of the Dean of the School of Science and Engineering Transfer and in the office of the Chemical Hygiene Officer. A copy of the CHP should be readily available to all personnel in the laboratory.

1.2 Scope

The provisions of the CHP apply to all Springfield Technical Community College laboratory personnel, other employees who routinely visit or occasionally work in the laboratory, and all contractors who might be exposed to laboratory hazards while at Springfield Technical Community College. Employees are encouraged to contribute their skills and knowledge to the CHP such as routine activities, chemical safety, hazardous material handling, or procedures to minimize chemical exposures.

The Chemical Hygiene Officer (CHO), will annually review the CHP for effectiveness and amend as necessary. New employees will be required to review and understand the CHP as part of their New Employee Orientation and all laboratory personnel will receive annual CHP training.

2.0 ROLES AND RESPONSIBILITIES

2.1 President

- Has the ultimate responsibility for chemical safety within the College and must provide continuing support for safety at all levels.

2.2 Deans and Faculty

- Responsible for safety within their laboratories/departments.

2.3 Chemical Hygiene Officer (CHO)

- Development and implementation of appropriate chemical hygiene policies and practices;
- Monitoring the procurement, use, and disposal of chemicals used in the laboratories;
- Conducting formal, documented chemical hygiene/housekeeping inspections of laboratories and safety equipment and assuring that follow-up items are addressed in a timely manner;
- Assisting in the design and development of safe facilities; working with Facilities or the STCC Police to promote safe facilities;
- Knowing current legal requirements for regulated substances;
- Assisting Laboratory Technicians or Faculty or other relevant Supervisors in developing policies and procedures specific to the work being conducted in their areas;
- Assisting Laboratory Technicians or Faculty or other relevant Supervisors in determining which personnel require personal protective equipment;
- Conducting accident investigations as requested and assisting Supervisors in their efforts to reduce the potential for recurrence of these events by using appropriate protective equipment or changing work practices; and
- Reviewing the CHP on an annual basis and making changes as needed.

2.4 Laboratory Technicians, Faculty, and Academic Deans

Holds the primary responsibility for chemical hygiene in his/her laboratory, including:

- Ensuring that those responsible for lab safety during instruction of classes or during use of hazardous materials read and follow the CHP, which includes the use of appropriate protective equipment and clothing;
- Ensuring that this equipment is available and in working order, and that staff have been trained in its correct usage;

- Determining, with the help of the CHO, the required levels of protective apparel and equipment;
- Ensuring that all hazardous waste is disposed of in accordance with all municipal, state and federal regulations; this includes the segregation, containment, and labeling of materials generated in the laboratory;
- Performing informal safety and housekeeping inspections of all his/her laboratory areas;
- Reporting to the designated departments or individuals at the College any accident or spill occurring in the laboratory, and working with those designated departments or individuals to institute necessary procedures or work practices to prevent recurrence of such events; ensuring that any injured employee receives appropriate medical attention.

2.5 Laboratory Employees

- Responsible for reading, understanding, and following the policies and procedures outlined in the CHP;
- Planning and conducting each operation in accordance with the CHP; and, when required, obtaining prior approval from the Chemical Hygiene Officer or Academic Dean;
- Wearing appropriate personal protective equipment and following safe work practices as outlined in the CHP;
- Notifying the Academic Dean or Director of a relevant department such as Facilities or STCC Police when equipment is malfunctioning or safety apparel is not available;
- Labeling and disposing of hazardous waste in compliance with Springfield Technical Community College's CHP;
- Review and understand the CHP and applicable laboratory specific procedures in their entirety before beginning work in the laboratory or with hazardous chemicals; and
- Notifying the Academic Dean AND the STCC Police of any incident or accident involving hazardous chemical substances.

3.0 STANDARD OPERATING PROCEDURES

Springfield Technical Community College supports the implementation of prudent laboratory practices when working with chemicals in a laboratory. These include general and laboratory-specific procedures for work with hazardous chemicals, emergency procedures, and laboratory waste procedures.

Procedures have been put in place to protect employees from health hazards and physical hazards in the Springfield Technical Community College laboratories.

3.1 Laboratory General Safety Procedures

Springfield Technical Community College has established general lab procedures to ensure that laboratory personnel maintain healthy and safe work practices in laboratory. All employees working in laboratories must adhere to the following policies when laboratory work involves the use of hazardous chemicals. Failure to do so will be reported to the employee's supervisor.

- Always read and understand the Safety Data Sheet for the chemicals you work with before handling.
- Do not use broken or chipped glassware, and dispose of it in a designated marked container (e.g., "broken glass only").
- Never pipette by mouth; always use a pipette aid or suction bulb.
- Do not apply cosmetics in the laboratory.
- Wash hands and arms thoroughly before leaving the laboratory, even if gloves have been worn.
- Food and drink are forbidden in the laboratory and lab prep areas.
- All chemical containers such as test tubes, beakers, and flasks must be labeled with the full chemical name.
- Do not work alone in the laboratory if the procedures being conducted or materials are hazardous.

3.2 Accident and Incident Reporting

All accidents, incidents, and near misses that result in personal injury or illness, damage, and or a potential for significant injury or property loss to Springfield Technical Community College property shall be properly reported and investigated. Reporting is accomplished by completing an **Incident Report Form**. All accidents, incidents, and near misses that result in personal injury or illness, damage, and or a potential for significant injury or property loss to Springfield Technical Community College property shall be properly reported and investigated. Reporting is accomplished by completing an **Incident Report Form**. The completed form should be submitted to the relevant academic dean and the STCC Police without delay and Human Resources if employees are involved. If treatment is necessary, or depending on the severity of the exposure, the employee will be sent to Concentra or emergency room.

All accidents or near misses should be carefully investigated by the CHO, with the results distributed to all who might benefit. The Incident Report Form should be completed by the person who had oversight of the area or the exercise or the task being performed at the time the incident occurred. **If the incident involves hazardous materials or results in injury or potential injury, the incident should be**

immediately reported to the STCC Police by calling 3911. First priority will be life safety and response will be managed by emergency responders accordingly, including police, fire and EMS. Investigative authority will be assumed by the appropriate agency or agencies as determined by the incident specifics and subject-matter jurisdiction.

3.3 Chemical Storage

- All chemicals in the laboratory should have a designated storage area and should be returned after each use or at the end of each work shift whichever occurs first.
- Avoid storing chemicals on bench tops and floors.
- Storage trays or secondary containers should be used to minimize spillage of material if a container breaks or leaks.
- Avoid storing chemicals in the fume hood because containers and equipment can interfere with airflow, clutter the work space, and increase the amount of material that could become involved in a hood fire.
- Avoid storing chemicals in direct sunlight or near a heat source.
- Physically separate incompatible chemicals using a secondary containment bin or tray, and or store at another designated location.
- All chemical containers must be properly labeled and stored in labeled storage areas.
- Avoid storing chemicals above eye level.
- Refrigerators used for storage of flammable chemicals must be flammable-proof or explosion-proof, laboratory-safe units.

3.4 Hazardous Waste Management and Disposal

3.4.1 Management

Hazardous waste chemicals regulated by the Environmental Protection Agency must be collected, labeled, packaged, and disposed of according to federal and state hazardous waste regulations.

Hazardous waste is any solid, liquid, sludge, or containerized gas that is discarded, has served its intended use, or is manufacturing by-product, and exhibits any of the characteristics identified below:

- Flammable
- Corrosive
- Reactive

- Toxic

It is the responsibility of the waste generator to adhere to proper waste management and disposal policies. Hazardous waste shall be collected in an appropriate container pending transfer to the Springfield Technical Community College Main Accumulation Area (MAA) or Satellite Accumulation Area (SAA) for chemical waste handling or pickup by Triumvirate Environmental.

3.4.2 General Procedures for Disposal

- Waste labelling should include the full names of any chemicals present; simply labelling with the formula is not sufficient.
- Any material that meets the criteria of a hazardous waste shall not be treated or otherwise changed to alter its characteristics as a hazardous waste.
- Empty containers of hazardous materials shall be rinsed three times before disposal. The first rinse shall be collected as hazardous waste.
- Dispose of all waste in designated, labeled containers. Any questions about proper disposal methods should be directed to the CHO or the Triumvirate contractors.
- Do not combine different waste streams (i.e. incompatible hazardous materials).
- Do not overfill containers.
- Manage common laboratory waste (uncontaminated gloves, paper towels, etc.) in the general trash.

3.4.3 Storage and Handling for Hazardous Waste

- All hazardous waste generated at Springfield Technical Community College must be accumulated and stored in a SAA before being transferred to the MAA.
- The SAA's are marked by a sign defining the SAA. The area is used for the accumulation of waste generated at the point of generation.
- All SAA waste containers must be labeled with SAA labels or the words "Hazardous Waste" with the full chemical name and hazard class (e.g. flammable).
- When an SAA waste container becomes full, date the container with the 'full date'.
- SAA containers can remain in the SAA indefinitely or until they become full. Full containers must be moved into the MAA within three days of the full date.
- All containers must be closed and sealed when not in use.
- Waste must be stored in containers compatible with the constituents of the waste.
- The MAA is located on the 5th floor and must remain locked at all times.

- Secondary containment bins must be used to prevent mixing of incompatible waste streams.

3.4.4 Lab-Pack Chemicals

Expired or unwanted chemicals should not remain in chemical stock areas, but should be moved to the MAA.

3.4.5 Broken Glass Disposal

- Broken glass and sharp objects shall never be disposed in general trash receptacles or recycling bins.
- Glass bottles (not eligible for recycling) shall be empty and their labels defaced before discarding.
- Glass bottles or broken glass must be disposed of in cardboard “Deposit Glass Here’ boxes. These boxes are available throughout the laboratories.
- Seal the top of the box closed with tape when it is full and label it ‘trash’.

3.4.6 Universal Waste Management

- Fluorescent lamps, cathode ray tube (CRT) screens, NiCad or rechargeable batteries, and mercury containing devices such as thermostats are classified as Universal Waste in Massachusetts and cannot be disposed in the general trash. For disposal contact the CHO or Triumvirate by emailing hazmat@stcc.edu who will schedule a pick-up with the appropriate personnel.

3.5 Chemical Procurement

Before a chemical is received, information on proper handling, storage, and disposal should be reviewed. No container should be accepted without an adequate label. All chemicals should be received on the loading dock.

3.6 Chemical Inventory Control

Springfield Technical Community College uses CEMS software to record their chemical inventory. This system allows employees to search for the location and/or quantity of a specific chemical.

3.7 Housekeeping

- Laboratory fume hoods and work areas should be kept clean and free of debris at all times.
- Do not allow trash to accumulate in any area. It can be a fire hazard and or obstruct emergency

equipment and egress.

- Do not store food or drink in any chemical laboratory or lab prep area.
- Access to exits, emergency equipment, and utility controls should never be blocked.

3.8 Emergency Procedures

In the event of an emergency, all employees are trained to exit the building immediately and meet at the assembly area. Personnel should not enter the building until they have received notification to do so from the appropriate authority. The STCC Police should be notified by calling 3911 upon discovery of a spill or accident, and is trained to take the appropriate response actions.

3.9 Hazard Assessment

A hazardous chemical means a chemical for which there is statistically significant evidence that acute or chronic health effects may occur in exposed laboratory personnel. An acute health effect is an adverse health effect characterized by severe symptoms that develop rapidly. A chronic health effect is an adverse health effect with symptoms that develop slowly over a relatively long period of time.

A hazard assessment must be completed to identify the physical and health hazards of chemicals used in the laboratory and determine the risk of exposure to the body. A physical chemical hazard is a chemical that is proven to be a combustible liquid, flammable, a compressed gas, explosive, an organic peroxide, an oxidizer, pyrophoric, unstable or water reactive. A health hazard means a chemical for which there is statistically significant evidence that acute or chronic health effects may occur in exposed employees. Chemicals that are health hazards include carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes.

A hazard assessment should include: identifying the hazard type (s), selection of appropriate PPE, training laboratory personnel, storage and handling requirements, control measures, signs and symptoms of an exposure, and spill and decontamination procedures.

3.10 Procedures for Prior Approval

There will be times where there is a significant change in chemical amounts, new equipment, or a situation where one must work alone with highly hazardous chemicals. It is recommended that laboratory personnel communicate these changes to their coworkers and to the Chemical Hygiene Officer for approval prior to beginning these procedures. General safety considerations include:

- Experimental design
- Equipment design
- Work space adequacy
- Development of an SOP
- Work preparedness
- Hazard assessment

4.0 SPECIAL PROCEDURES FOR HANDLING HAZARDOUS CHEMICALS

The Lab Technician shall ensure that all lab personnel are aware of the locations, hazards, and appropriate control measures for work involving hazardous chemicals. In some cases, laboratory-specific procedures may be required for working with highly hazardous materials. Review the SDS (SEE SECTION 5.2.1) for specific handling and storage requirements of hazardous chemicals. Some specific hazards that may be present in various laboratories at Springfield Technical Community College are listed below.

4.1 Asphyxiants

Asphyxiants are substances that interfere with the transport of an adequate supply of oxygen to the vital organs of the body. Simple asphyxiates are substances that displace oxygen from the air being breathed to such an extent that adverse effects result. Acetylene, carbon dioxide, argon, helium, ethane, nitrogen, and methane are common asphyxiates. It is important to recognize that even chemically inert and biologically benign substances can be extremely dangerous under certain circumstances, such as carbon monoxide.

4.2 Compressed Gas

Gas cylinders contain either compressed liquids or gases. Gas cylinders represent the most insidious hazard, as puncture, heat, faulty valves, pressure or regulators may result in a rapid release of the entire contents. The following safety considerations should be implemented where applicable:

- The cylinder contents must be clearly identifiable.
- Handle cylinders carefully and do not roll, slide, or drop. Use a cart or hand truck to transport.
- Do not lift a cylinder by its cap.
- Secure all cylinders while in storage, transport, or use.
- Never tamper with cylinder valves, force connections, or use homemade adapters. Use only approved equipment. Never repair or alter cylinders, valves, or safety relief devices.

- Only use a regulator compatible with the cylinder contents.
- Close the cylinder valve when not in use.
- When empty, turn off the cylinder valve and label the cylinder as empty. Store separately from full cylinders.
- Store cylinders in a well ventilated area away from ignition sources, heat, flames, and flammable chemicals.
- Keep the protective caps on the cylinders at all times except when the cylinders are in active use.
- Check for gas leaks using soapy water around the connections.
- Do not store flammable gas cylinders with oxidizers such as nitrous oxide or oxygen. They must be separated by a minimum of 20 ft. or a 5 foot fire wall.

4.3 Corrosive Chemicals

The Resource Conservation and Recovery Act (RCRA) defines a corrosive chemical as a liquid with a pH ≤ 2 or ≥ 12.5 . Acids and bases can cause severe tissue damage depending on the corrosivity of the chemical. The primary means of protection from corrosive chemicals is the use of gloves, goggles, face shields, aprons, lab coats, and other chemical resistant clothing. Exercise extreme caution when handling corrosive chemicals. The following safety considerations should be implemented where applicable:

- Transport acids and bases in a bottle carrier or cart. Do not handle by the neck alone; support the weight of the bottle from the bottom when handling or pouring.
- Do not store acid and bases with flammable liquids or oxidizing chemicals. Store perchloric acid by itself.
- Isolate corrosive chemicals from incompatible chemicals.
- Reference the chemical's SDS (SEE SECTION 5.2.1) for proper handling, PPE, and storage requirements.
- If an acid or base comes in contact with your skin or clothing, thoroughly wash the affected areas utilizing the safety showers or eyewash units.

4.4. Hydrofluoric and Perchloric Acid

The college recognizes the dangers of hydrofluoric acid and has a policy that it will not purchase hydrofluoric acid nor will it ever be in possession of hydrofluoric acid or have it on campus. In addition, given the many dangers and precautions associated with the use of perchloric acid, it is the policy of the

college that no perchloric acid be purchased or used on campus or in any college facility without prior written permission of the chemical hygiene officer.

4.5 Flammable and Combustible Chemicals

Flammable chemicals are considered to be liquids with a flashpoint below 100 °F and solid materials that readily sustain combustion. Liquids with a flashpoint between 100 °F and 200 °F are generally classified as combustible; the same basic procedures should be applied when handling combustible liquids.

- Do not allow smoking or other sources of open flames in areas where flammable chemicals are used.
- Know the location fire extinguishers, fire alarms, and emergency exits in the laboratory.
- Do not store flammable liquids in domestic-type refrigerators. Use only refrigerators rated for flammables.
- Do not store flammables with oxidizing agents (e.g., nitric, perchloric, and sulfuric acids).
- Do not expose flammable liquids to potential sources of ignition such as electrical equipment, heat, burners, or open flames.
- To prevent accidental electrical charge, the use of bonding and grounding equipment should be used whenever applicable. The use of non-sparking tools can prevent an ignition source.
- Store flammable liquids in an approved fire rated flammable storage cabinet.
- Do not store flammable liquids on the floor, unless protected by secondary containment.
- Minimize the amount flammable liquids that are in use, being stored, and that are generated as wastes.
- Storage of flammable liquids greater than 10 gallons within a laboratory fire area must be in an approved and labeled flammable storage cabinet.
- The Safety Data Sheet (SDS -- SEE SECTION 5.2.1) shall be reviewed by the owner/user of the materials for additional safety requirements and precautions.

4.6 Irritants

An irritant is a chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact. A wide variety of organic and inorganic chemicals are irritants; thus, skin contact with all laboratory chemicals should be avoided. Use a properly functioning chemical fume hood when handling irritants that can be inhaled. At minimum, safety glasses, lab coat, long pants, protective gloves, and closed toed shoes should be worn.

4.7 Organic Peroxides

Organic peroxides are hazardous because of their extreme sensitivity to shock, sparks, heat, light, strong oxidizing and reducing agents, and other forms of detonation. Organic peroxides may cause fire, create explosion hazards, and may be toxic or corrosive. Some organic peroxides are dangerously reactive, decomposing very rapidly or explosively if they are exposed to only slight heat, friction, mechanical shock or contamination with incompatible materials.

4.7.1 Records, Storage, Labelling, and Disposal

- Maintain a record to indicate the date of receipt, the date the container was first opened, and disposal date. Forward regular updates of this record to the Dean for Science and Engineering Transfer or Chemical Hygiene Officer.
- The College will only store a chemical classified as a peroxide former for a period of **1 year** after which the chemical will be disposed of according to the hazardous waste protocol.
- Disposal will occur regardless of how much of the chemical may still be available in the container and/or regardless of whether or not the container was ever opened to begin with.
- Label the container clearly stating **Warning – Peroxide Former**. Also affix a label indicating the date of receipt, date of opening, testing schedule, and disposal date.
- Store all peroxidizable compounds in tightly closed, air-impermeable, light-resistant containers, away from light, heat, direct sunlight, sources of ignition, oxidizers, and oxidizing agents. In some cases, storage under Nitrogen may be advisable (refer to the SDS).
- Make sure caps are replaced promptly after use. Store in the original manufacturer's container whenever possible. Protect containers from shock and friction, and do not shake.
- If a peroxide-forming chemical or container is of unknown age or history, if crystals or solid masses are visibly present on or in the container or lid, or if the chemical shows discoloration, string-like formations, or liquid stratification, do not open the container and contact the college's EHS contractor for assistance.
- The Chemical Hygiene Officer will periodically check for the formation of crystals on containers holding chemicals classified as peroxide formers. Any that are deemed to be hazardous based on crystal formation will be disposed of as hazardous waste.
- Most peroxides are not volatile but the solvents in which they form are. Loss of solvent via an ill-fitting lid can concentrate any peroxides that are present. A nearly empty container, for which the solvent cannot be accounted, may be a hazard. Contact the college's EHS contractor

for assistance.

- Immediately rinse empty containers that once held peroxide-forming solvents. Do not allow residues to evaporate. Do not attempt to open or rinse a container of unknown age and history. Contact the college's EHS contractor for assistance.
- Peroxide detection test strips are commercially available from most laboratory equipment supply vendors. Follow the manufacturer's instructions for storing and using the product. Observe any product expiration dates to ensure adequate detection. If peroxides are detected – contact the college's EHS contractor for disposal.
- The Chemical Hygiene Officer is responsible for ensuring that the inventory of such chemicals is current and that any chemicals in this classification that are due to be disposed of are in fact disposed of.

4.7.2 Handling Precautions

Precautions for handling peroxides should include the following:

- Limit the quantity of peroxides.
- Do not return unused peroxides to the container.
- Clean up all spills immediately. Solutions of peroxides can be absorbed using vermiculite or other absorbing material.
- Do not permit smoking, open flames, and other sources of heat near peroxides. Areas should be labeled that contain peroxides so that this hazard is evident.
- Avoid friction, grinding, and other forms of impact near peroxides, especially solid peroxides. Glass containers that have screw-cap lids or glass stoppers should not be used. Polyethylene bottles that have screw-cap lids may be used.
- Isolate from incompatible materials such as strong acids and bases, flammable and combustible liquids, and reducing agents.

4.8 Oxidizers

Oxidizers are chemicals other than a blasting agent or explosive as defined in § 1910.109(a), that initiates or promotes combustion in other materials, causing fire either of itself or through the release of oxygen or other gases. Examples include perchloric acid, potassium persulfate, and lead nitrate.

Precautions for handling oxidizers should include the following:

- Minimize the amount of oxidizers used and stored.

- Isolate from incompatible chemicals (e.g., organics, flammable, dehydrating, or reducing agents).
- Do not store oxidizers in wooden cabinets or on wooden shelves.
- Do not return unused material to the original container.
- Store in a tightly closed container and in a cool, dry, ventilated area.
- Perchloric acid may not be used in any fume hood except those specifically designed for perchloric acid use.

4.9 Pyrophoric Chemicals

Pyrophoric chemicals are extremely reactive toward oxygen and water, and must never be exposed to the atmosphere. Examples include sodium hydride and magnesium. Exposure of these chemicals to the air could result in spontaneous combustion, which could cause serious burns or other injuries to the person handling the chemical or others in the immediate area. In addition, all combustible materials, including paper products, should not be allowed to come in contact with any pyrophorics at any time. Pyrophorics can be handled and stored safely as long as all exposure to atmospheric oxygen and moisture is avoided. Solids must be transferred under an inert atmosphere in an efficient glove box. Glass bottles of pyrophorics should not be handled or stored unprotected. The metal container shipped with each bottle should be retained as a protective container for each bottle for transporting and storage

4.10 Reproductive Toxins

Reproductive toxins are chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis). Reproductive toxins have adverse effects on various aspects of reproduction, including fertility, gestation, lactation, and general reproductive performance. Reproductive toxins can affect both men and women. Male reproductive toxins can in some cases lead to sterility. Two well-known male reproductive toxins are ethylene dibromide and dibromochloropropane. When a pregnant woman is exposed to a chemical, generally the fetus is exposed as well because the placenta is an extremely poor barrier to chemicals.

4.11 Select Carcinogens

A carcinogen is a substance capable of causing cancer. Carcinogens are particularly insidious toxins because they may have no immediate apparent harmful effects. Carcinogens should be handled using prudent practices. A chemical is considered to be a carcinogen if:

- It has been evaluated by the International Agency for Research on Cancer (IARC), and found to be a carcinogen or potential carcinogen; or
- It is listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or,
- It is regulated by OSHA as a carcinogen.

4.12 Toxic Chemicals

Toxic is defined by OSHA 29 CFR 1910.1200 as a chemical which falls in any of these three categories:

- A chemical that has a median lethal dose (LD50) of more than 50 milligrams per kilogram but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
- A chemical that has a median lethal dose (LD50) of more than 200 milligrams per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.
- A chemical that has a median lethal concentration (LC50) in air of more than 200 parts per million but not more than 2,000 parts per million by volume of gas or vapor, or more than two milligrams per liter but not more than 20 milligrams per liter of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

4.13 Water-Reactive Chemicals

Water-reactive chemicals are likely to become spontaneously flammable or give off flammable or toxic gas when in contact with water. Examples include aluminum powder, barium, calcium hydride, and sodium borohydride. Protect from moisture and separate from incompatibles. Store these chemicals in accordance with manufacturer or applicable SDS (SEE SECTION 5.2.1) requirements.

5.0 CONTROL MEASURES

For the laboratory use of OSHA regulated substances, Springfield Technical Community College will take measures to minimize the risk of laboratory personnel exposure to such substances. To minimize employee exposure to hazardous chemicals, the following control measures for reducing chemical exposure should be implemented:

- Substitution of less hazardous chemical or processes

- Engineering controls
- Administrative controls
- Personal protective equipment (PPE)

Substitution, engineering controls, administrative controls, and personal protective equipment (PPE) are basic principles used to control hazards and exposures. Before the proper control (s) can be selected, a hazard assessment of the process, activity, or material should be conducted.

5.1 Substitution

Every hazard assessment should first determine if the hazardous conditions can be prevented, e.g., substituting with a less hazardous chemicals or process. Substitution is one of the most effective ways to eliminate or reduce exposures because it removes the hazard at the source.

5.2 Administrative Controls

Administrative controls are changes in work procedures such as written safety guidelines, rules, supervision, schedules, signs, labels, SDS sheets (SEE SECTION 5.2.1) , and training to reduce employee exposure to hazardous chemicals.

5.2.1 Safety Data Sheets

SDSs are documents created by the chemical manufacturer that describe the substance. Some information found on an SDS includes: chemical and physical characteristics, handling requirements, storage and disposal information, and signs and symptoms of exposure. SDSs are required for all chemicals at Springfield Technical Community College and must remain on file for 30 years after employment. OSHA requires up-to-date SDSs that are readily available for each chemical. The Chemical Hygiene Officer is responsible for obtaining SDSs for chemicals used and stored at Springfield Technical Community College. SDS sheets shall be maintained in binders in each laboratory. Spanish SDS sheets are available upon request. SDS sheets are accessible to all personnel and regulatory inspectors as needed. Employees have a right to access any or all SDS sheets. If an SDS is not included in the shipment, Springfield Technical Community College shall contact the chemical manufacturer in order to obtain the SDS.

5.2.2 Signs and Labels

All hazardous materials, hazardous waste, and chemical storage areas shall be appropriately labeled indicating the hazards present and any other relevant regulatory requirements. All chemical containers

at Springfield Technical Community College must be labeled regardless of size and whether or not they are hazardous. Labeling of all chemical containers assists emergency personnel and others in identifying what is and what is not hazardous should a spill occur or other emergency situation arise. Original labels on chemical containers must not be removed or defaced. Labels must be in English and they must contain the complete name of the chemical and be traceable or easily linked to the appropriate SDS (SEE SECTION 5.2.1) (chemical formulas are not allowed). The manufacturer's label is generally sufficient and should be replaced only if it becomes damaged or illegible. All containers into which chemicals are transferred also need to be legibly labeled in English and include the name of the chemical and appropriate hazard warnings (chemical formulas are not allowed). The National Fire Protection Association (NFPA) 702 diamond should be utilized to ensure uniform labeling. The NFPA system requires the chemical name to be listed along with health, flammability, reactivity and specific hazard ratings. Refrigerators or freezers containing either chemicals or food should be appropriately labeled, e.g., chemicals only, no food or drink, or food and drink only.

All laboratories shall be posted with signage addressing the hazards of the materials contained in the lab, requirements for personal protective equipment, and any special hazards located in the lab. An NFPA 702 diamond can be used for hazard notification.

5.3 Engineering Controls

Engineering controls eliminate or reduce exposure to a chemical or physical hazard through the use or substitution of engineered machinery or equipment. Engineering controls include process change, substitution, isolation, ventilation, and source modification.

- **Process change** consists of changing a process to make it less hazardous (e.g., paint dipping in place of paint spraying).
- **Substitution** consists of substituting for a less hazardous material, equipment, or process (e.g., use of soap and water in place of solvents, use of automated instead of manually operating equipment).
- **Isolation** is applied when a barrier is inserted between a hazard and those who might be affected by that hazard. Separating personnel from hazardous operations, processes, equipment, or environments using a physical barrier or distance may provide the necessary isolation.
- **Ventilation** can be either local (direct air movement) or general (dilution of air contaminants) that exhausts or supplies air properly.

- **Source modification** consists of changing a hazard source to make it less hazardous (e.g., wetting dust particles or lowering the temperature of liquids to reduce off-gassing and vaporization).

5.4 Personal Protective Equipment (PPE)

Springfield Technical Community College is required to determine if PPE should be used to protect their laboratory personnel. PPE should be used in conjunction with guards, engineering controls, and administrative controls. PPE may be required to reduce employee exposure to hazards when engineering and administrative controls are not feasible or effective in reducing these exposures to acceptable levels. PPE should always be worn if there is a possibility that personal clothing could become contaminated with hazardous materials. Examples include: laboratory coats, aprons, jumpsuits, boots, shoe covers, and gloves. Review SDSs (SEE SECTION 5.2.1) to determine the necessary PPE to limit exposure. The kind of PPE needed depends on how the chemical enters the body. This is called route of exposure and is listed on the SDS (SEE SECTION 5.2.1). The four major routes of exposures are skin absorption, inhalation, ingestions, and injection.

5.4.1 Eye and Face Protection

Safety glasses with side shields that conform to ANSI standard Z87.1-2010 should be required for work with hazardous chemicals. Ordinary prescription glasses with hardened lenses do not serve as safety glasses. Although safety glasses can provide protection from injury from flying particles, they offer little protection against chemical splashes. Splash goggles should be worn if there is a splash hazard in any operation involving hazardous chemicals. Full face shields are worn in conjunction with either safety glasses or splash goggles. When there is a possibility of liquid splashes, both a face shield and splash goggles should be worn; this is especially important for work with highly corrosive liquids. Full-face shields with throat protection and safety glasses with side shields should be used when handling highly hazardous chemicals. If work in the laboratory could involve exposure to lasers, ultraviolet light, infrared light, or intense visible light, specialized eye protection should be worn. Safety glasses should be provided for visitors in the laboratory.

5.4.2 Hand Protection

When handling hazardous chemicals, employees shall select and wear the appropriate gloves. No single glove can provide appropriate protection in every work situation. It is important to assess the hazards in each task and select a glove that provides the required protection. Below are general recommendations for glove selection and use:

- Similar gloves supplied by different manufacturers may not offer the same level of protection; therefore, the manufacturer's glove selection chart may need to be reviewed.
- Select gloves which are resistant to the chemicals you may be exposed to. Consult the relevant SDS (SEE SECTION 5.2.1) which may recommend a particular glove material.
- Select gloves of the correct size and fitting; gloves that are too small are uncomfortable and may tear whereas larger gloves may interfere with dexterity.
- Before use, check gloves (even new ones) for physical damage such as tears and pin holes.
- When removing gloves, do so in a way that avoids the contaminated exterior contacting the skin.
- Wash hands after removing gloves.

Many factors affect the breakthrough times of gloves including: thickness of glove material, chemical concentration, amount of chemical that comes into contact with the glove, length of time the glove is exposed to the chemical, temperature at which the work is done, and possibility of abrasion or puncture. Glove selection guides are available from most manufacturers.

If chemicals do penetrate the glove material, they could be held in prolonged contact with the hand and cause more serious damage than in the absence of a proper glove. Gloves should be replaced immediately if they are contaminated or torn. The use of double gloves may be appropriate in situations involving chemicals of high or multiple hazards. Leather gloves are appropriate for handling broken glassware and inserting tubing into stoppers, where protection from chemicals is not needed. Gloves should be decontaminated or washed appropriately before they are taken off and should be left in the laboratory and not be allowed to touch any uncontaminated objects in the laboratory or any other area. Gloves should be replaced periodically, depending on the frequency of use.

5.4.3 Lab Coats, Protective Suits & Aprons

Appropriate laboratory coats should be worn, buttoned, with the sleeves rolled down. Laboratory coats should be fire-resistant and fully covering. Laboratory coats or laboratory aprons made of special materials are available for high-risk activities. Laboratory coats that have been used in the laboratory should be left there to minimize the possibility of spreading chemicals to eating and office areas, and they should be cleaned regularly. Rings, bracelets, watches, or other jewelry that could trap chemicals close to the skin, come in contact with electrical sources, or get caught in machinery. Removing these items before working with chemicals is strongly recommended. Leather clothing or accessories should not be worn in situations where chemicals could be absorbed in the leather and held close to the skin.

5.4.4 Laboratory Attire

When performing work with hazardous materials, laboratory personnel should cover all exposed parts of their body to prevent unnecessary chemical exposure. Tie long hair back, avoid loose clothing such as neckties and flowing sleeves.

5.4.5 Foot Protection

Closed toed shoes should be worn in areas where hazardous chemicals are in use or mechanical work is being done. Clogs, perforated shoes, bare feet, sandals, and cloth shoes do not provide protection against chemicals. Shoe covers may be required for work with especially hazardous materials.

6.0 EQUIPMENT, MAINTENANCE, AND INSPECTIONS

6.1 Fume Hoods

The laboratory fume hood is the most common local exhaust method used in laboratories. When working with hazardous chemicals, the use of the fume hood is required at Springfield Technical Community College. A properly operating and correctly used fume hood will control vapors, dusts, and mists released from volatile liquids. Fume hoods can also protect from accidental spills. Fume hoods are inspected and certified annually. The STCC Police will contract with a vendor to perform an annual inspection of the fume hoods and will notify appropriate entities if repairs are needed. Chemical Hygiene Officer will periodically ensure that fume hoods have updated certification labels and are functioning properly. Except when adjustments to the apparatus are being made, the hood should be kept closed, with vertical sashes down and horizontal sashes closed, to help prevent the spread of a fire, spill, or other hazards into the laboratory. Basic guidelines for operating a fume hood include the following:

- Confirm that the fume hood has been certified within the last year (label with date).
- Confirm that the chemical can be used in the fume hood.
- Conduct procedure at least six inches behind the plane of the sash.
- Never put your head inside a fume hood to check an experiment.
- Work with the sash at the lowest position possible to protect your face and body.
- Do not clutter the fume hood with bottles, chemicals, or equipment as it restricts airflow and work space.
- Immediately report any suspected fume hood malfunctions to Chemical Hygiene Officer.
- Limit foot traffic behind while performing operations in the hood.

6.2 Safety Showers and Eyewash Stations

In case of an exposure to hazardous substances, a reliable, clean source of water must be available to rinse contaminants from the body. Safety showers are located in all of Springfield Technical Community College's laboratories. Eyewash stations are located near sinks in the laboratories. Laboratory supervisors must ensure that safety showers and eyewash stations are free from obstruction. Laboratory supervisors are responsible for ensuring that their personnel are aware of the nearest safety shower and eyewash station location and how to use the device. Springfield Technical Community College is responsible for conducting monthly inspections of the eyewash stations. The STCC Police will contract with a vendor to perform annual inspections of the emergency showers and eyewash stations and notify appropriate entities if repairs are needed.

6.3 Inspections

The CHO will periodically conduct laboratory inspections. Inspections will include a walk-through of the selected area(s) and will cover lab safety, PPE, waste management, and related topics. Results of the inspections will be brought to lab technicians, and will be used as a guide to identify and correct similar and/or other environmental, health and safety issues in their area(s).

7.0 INFORMATION AND TRAINING

7.1 Information

Springfield Technical Community College will provide the following information to laboratory personnel prior to working with any chemical:

- The availability and location of the CHP.
- A copy of the Chemical Hygiene Plan
- SDS (SEE SECTION 5.2.1) s for all hazardous chemicals the employee will use.
- Standard Operating Procedures (SOPs) for all of the operations the employee will conduct involving hazardous chemicals.
- A description and use of the Springfield Technical Community College labeling system.
- Additional information on the hazards, safe handling, storage and disposal of hazardous chemicals can be obtained from the OSHA website, NIOSH website, and the chemical manufacturers.

7.2 Training

All employees working in a laboratory shall be trained to the contents of the CHP and all applicable SOPs

that are pertinent to a procedure, experiment, or task. Training shall include but is not limited to:

- Provisions of the CHP.
- Hazards in the laboratory.
- Signs and symptoms associated with exposures to hazardous chemicals.
- Safe handling, storage, and disposal of hazardous chemicals.
- How to read an SDS (SEE SECTION 5.2.1) .
- The selection and use of PPE.

7.3 Frequency of Training

Training shall be provided for laboratory personnel at the start of each semester to capture all full time faculty and any adjuncts who only contract for one semester as well as work-study students and students working as lab assistants. Training shall follow a schedule such that the initial employee training is conducted by the CHO and the subsequent annual training for an employee is accomplished through the CEMS platform online.

7.4 Recordkeeping

The CHO is responsible for establishing and maintaining records for employee training, employee environmental monitoring, and compliance records.

The Chief of Police is responsible for hazardous waste disposal compliance records.

8.0 MEDICAL CONSULTATION AND EXAMINATIONS

Springfield Technical Community College shall provide their employees who work with hazardous chemicals the opportunity for medical attention and follow-up by a competent physician if they show signs and symptoms of exposure. STCC contracts with Concentra Health Services for workplace injury, exposures, medical care and treatment.

8.1 Information Provided to the Physician

Springfield Technical Community College shall provide the following information to the physician:

- The identity of the hazardous chemical(s) to which the employee may have been exposed and the SDS (SEE SECTION 5.2.1) ;
- A description of the conditions under which the exposure occurred including quantitative exposure data, if available; and
- A description of the signs and symptoms of exposure employees are experiencing, if any.

8.2 Physician's Written Opinion

The Human Resource department of Springfield Technical Community College shall follow up with employee and health care provider regarding medical return to work clearance, leave time and workers compensation.

Glossary of Terms

PPE.....Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Personal protective equipment may include items such as gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, or coveralls, vests and full body suits.

SDS.....Safety Data Sheets include information such as the properties of each chemical; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting the chemical. The information contained in the SDS must be in English (although it may be in other languages as well).

Standard Operating Procedures

The following section represents the standard operating procedures relevant to hazardous materials. The SOPs are designed to help employees carry out their functions as they interact with hazardous materials. SOPs will be reviewed periodically and updated accordingly. All relevant personnel will be notified when updates are made.



Chemical Security

STCC Standard Operating Procedure

(revised 08/15)

(For assistance, please contact Campus Police at 3911 or the office of the Dean for Science and Engineering Transfer at 755-4576.

Security of dangerous chemicals in laboratories, studios and other areas at STCC is an area of concern. While the theft and misuse of chemicals is not commonplace, care must be taken to reduce the possibility of such events. Certain items may be subject to more restrictive requirements. For more information, refer to other STCC SOPs and *Chemicals of Concern- United States Department of Homeland Security Chemical Facility Anti-Terrorism Standards*.

- Keep laboratory, stock room, and other work area doors closed at all times, and locked when not occupied. Refrigerators and freezers should not be located in hallways.
- Storage vessels, such as fuel tanks, anhydrous ammonia tanks, etc., should be equipped with locking mechanisms to prevent theft. When possible, these items should be stored in secured fenced areas. If it is not possible to store in fenced areas, these types of vessels should be stored in well-lit and easily monitored areas during times when the facility is not staffed.
- Only authorized individuals should be in the work area. Strangers should always be able to account for their presence. If you do not feel comfortable with their answer, be prepared to take appropriate actions, such as 1) asking them if they need assistance; 2) politely asking them to leave the area; 3) asking them to follow you to the department office or office of a faculty member to seek information; or, 4) if necessary, calling STCC Police for assistance. Have an agreed upon procedure within the department for responding to suspicious individuals so that your response is proper and effective.
- Know the building schedule for locking doors. If strangers are present in the building after it has been secured, call STCC Police and report the situation.
- Inspect all packages of chemicals arriving at the work area. If stains are present on the package, or the package is damaged, isolate and secure the package and review possible contents. If there are any possible safety concerns, contact the EHS contractor (Triumvirate).
- When maintaining chemical inventories, pay particular attention to keeping an accurate inventory of highly toxic, dangerous, or reactive materials. If the inventory includes particularly dangerous chemicals or chemicals that are commonly used for illicit purposes, do not post the inventory in a public area.

- Provide additional security for highly toxic, dangerous, or reactive chemicals, such as a locked cabinet with controlled access to keys or security measures. Depending on the level of hazard, consider using an access validation process for such materials- e.g., access requires approval of another person each time, and perhaps, physical distribution by a second person. Discourage working alone.
- Report losses to the STCC Police and Dean's office immediately.
- Notify STCC Police and the Dean's office if non-chemical items are missing from work areas, such as nutrient agar, flasks, balances, scales, and other processing equipment.
- Report all suspicious activity to the STCC Police, including any threats to personnel or facilities.
- Report all attempted burglaries, sabotage to facilities or equipment and all vandalism, including any sign of product tampering, to the STCC Police.
- Keep a list of emergency contact numbers by all telephones, if not listed on the phone's receiver.
- To the extent possible, use less hazardous substitutes, use and store the smallest feasible quantities of chemicals with particular attention only ordering quantities needed for one semester or one academic year. In addition, work to reduce or eliminate any unnecessary storage, transportation, and handling of chemicals.



Peroxide Forming Chemicals

STCC

Standard Operating Procedure

(revised 04/15)

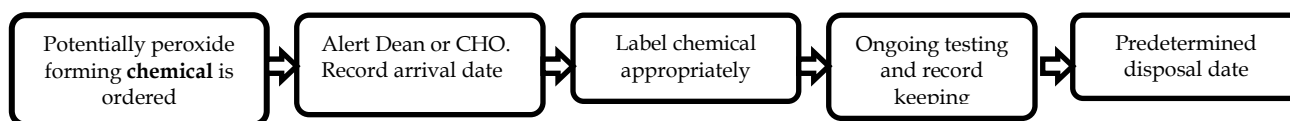
For assistance, please contact Campus Police at 3911 or the office of the Dean for Science and Engineering Transfer at 755-4576.

Some common laboratory chemicals can form peroxides. Once formed, peroxides can become extremely sensitive to thermal or mechanical shock and may explode violently. Peroxides are formed through a spontaneous reaction with oxygen. Simply opening the container can initiate peroxide formation. Light and heat can accelerate the process.

Manufacturers may add an inhibitor to peroxide forming chemicals to counter peroxide formation. For many peroxide-forming solvents, butylated hydroxy toluene (BHT) is added. BHT 'scavenges' oxygen in the solvent and prevents it from reacting with the solvent to form peroxides. Over time, BHT or other inhibitors can become exhausted allowing peroxides to form. Distilling the solvent can completely remove the BHT and make the solvent immediately susceptible to peroxide formation.

Common chemicals that are prone to forming peroxides are found at the end of this SOP.

Flow Chart for Basic Procedure for Peroxide Forming Chemicals (see below for more detail)



SAFE HANDLING AND USAGE PROCEDURE DETAILS

- As new peroxide forming chemicals arrive at the college (see list at end of this document) alert the Dean for Science and Engineering Transfer or Chemical Hygiene Officer of the arrival of the chemicals.
- Review the Safety Data Sheet (SDS) for the chemical for proper storage procedure.
- Maintain a record to indicate the date of receipt, the date the container was first opened, and disposal date. Forward regular updates of this record to the Dean for Science and Engineering Transfer or Chemical Hygiene Officer.
- Label the container clearly stating **Warning – Peroxide Former**. Also affix a label indicating the date of receipt, date of opening, testing schedule, and disposal date.
- Store all peroxidizable compounds in tightly closed, air-impermeable, light-resistant containers, away from light, heat, direct sunlight, sources of ignition, oxidizers, and oxidizing agents. In some cases, storage under Nitrogen may be advisable (refer to the SDS).

- Make sure caps are replaced promptly after use. Store in the original manufacturer's container whenever possible. Protect containers from shock and friction, and do not shake.
- If a peroxide-forming chemical or container is of unknown age or history, if crystals or solid masses are visibly present on or in the container or lid, or if the chemical shows discoloration, string-like formations, or liquid stratification, do not open the container and contact the college's EHS contractor for assistance.
- Most peroxides are not volatile but the solvents in which they form are. Loss of solvent via an ill-fitting lid can concentrate any peroxides that are present. A nearly empty container, for which the solvent cannot be accounted, may be a hazard. Contact the college's EHS contractor for assistance.
- Immediately rinse empty containers that once held peroxide-forming solvents. Do not allow residues to evaporate. Do not attempt to open or rinse a container of unknown age and history. Contact the college's EHS contractor for assistance.

TESTING

Peroxide detection test strips are commercially available from most laboratory equipment supply vendors. Follow the manufacturer's instructions for storing and using the product. Observe any product expiration dates to ensure adequate detection. If peroxides are detected – contact the college's EHS contractor for disposal.

COMMON PEROXIDIZABLE COMPOUNDS

As stated in Prudent Practices, “Essentially all compounds containing C-H bonds pose risk of peroxide formation if contaminated with various radical initiators, photosensitizers, or catalysts. For instance, secondary alcohols such as isopropanol form peroxides when exposed to normal fluorescent lighting and contaminated with photosensitizers, such as benzophenone. It is prudent to dispose of old samples of organic compounds of unknown origin or history, or those prone to peroxidation if contaminated; secondary alcohols are a specific example.”

Although not completely inclusive, following are common chemicals that are known to form peroxides (Prudent Practices).

Peroxide Hazard on Storage, without Concentration			
Butadiene	Chlorobutadiene (Chloroprene)	Divinyl acetylene	Isopropylether
Methacrylate	Potassium amide	Potassium metal	Sodium amide
Tetrafluoroethylene	Vinylidene chloride		
Hazard Due to Peroxide Concentration			
Acetal	Acetaldehyde	Benzyl alcohol	Cumene (Isopropylbenzene)
Cyclohexene	2-Cyclohexen-1-ol	Cyclohexanol	Cyclooctene
Cyclopentene	Decahydronaphthalene	Diacetylene	Dicyclopentadiene
Diethyl ether	Diethylene glycol dimethyl ether	Dioxanes	Ethylene glycol dimethyl ether
Furan	4-Heptanol	Isopropyl ether	Methyl acetylene
3-Methyl-1-butanol	Methyl cyclopentane	Methyl isobutyl ketone	2-Pentanol
4-Penten-1-ol	1-Phenylethanol	2-Phenylethanol	2-Propanol
Tetrahydrofuran	Tetrahydronaphthalene	Vinyl ethers	Other secondary alcohols
Auto-Polymerize as a Result of Peroxide Accumulation			
Acrylic acid	Acrylonitrile	Butadiene	2-Butanol

Chlorotrifluoroethylen	Ethyl acrylate	Methyl methacrylate	Tetrafluoroethylene
Styrene	Vinyl acetate	Vinyl acetylene	Vinyl chloride
Vinyl pyridine			

Much of the above information is from: *Prudent Practices in the Laboratory, Handling and Management of Chemical Hazards. Updated edition. National Research Council, 2011.*

Chemical that Form Peroxides but Cannot be Clearly Placed in One of the Above Categories¹			
Acrolein	Allyl ether	Allyl ethyl ether	Allyl phenyl ether
p-(n-Amyloxy)benzoyl	n-Amyl ether	Benzyl n-butyl ether	Benzyl ether
Benzyl ethyl ether	Benzyl methyl ether	Benzyl-1-naphthyl ether	1,2-Bis(2-chloroethoxy)ethane
Bis(2-ethoxyethyl)ether	Bis(2-(methoxyethoxy)ethyl)ether	Bis(2-chloroethyl)ether	Bis(2-ethoxyethyl)adipate
Bis(2-2-methoxyethyl) carbonate	Bis(2-methoxyethyl) ether	Bis(2-methoxyethyl) phthalate	Bis(2-methoxymethyl) adipate
Bis(2-n-butoxyethyl) phthalate	Bis(2-phenoxyethyl)ether	Bis(4-chlorobutyl)ether	Bis(chloromethyl)ether
2-Bromomethyl ethyl	Beta-Bromophenetole	o-Bromophenetole	p-Bromophenetole
3-Bromopropyl phenyl ether	t-Butyl methyl ether	n-Butyl phenyl ether	n-Butyl vinyl ether
Chloroacetaldehyde diethylacetal	2-Chlorobutadiene	1-(2-Chloroethoxy)-2-phenoxyethane	Chloroethylene
Chloromethyl methyl	b-Chlorophenetole	o-Chlorophenetole	p-Chlorophenetole
Cycloacetene	Chlorpropyl methyl ether	Diallyl ether	p-Di-n-butoxybenzene
1,2-Dibenzoyloxyethane	p-Dibenzoyloxybenzene	1,2-Dichloroethyl ethyl ether	2,4-Dichlorophenetole
Diethoxymethane	2,2-Diethoxypropane	Diethyl ethoxymethylenemalonate	Diethyl fumarate
Diethyl acetal	Diethylketene	m,o,p-Diethoxybenzene	1,2-Diethoxyethane
Dimethoxymethane	1,1-Dimethoxyethane	Di(1-propynyl)ether	Di(2-propynyl)ether
Di-n-propoxymethane	1,2-Epoxy-3-isopropoxypropane	1,2-Epoxy-3-phenoxypropane	p-Ethoxyacetophenone
1-(2-Ethoxyethoxy)ethyl	(2-Ethoxyethyl)-a-benzoyl benzoate	1-Ethoxynaphthalene	o,p-Ethoxyphenyl isocyanate
1-Ethoxy-2-propyne	3-Ethoxypropionitrile	2-Ethylacrylaldehyde oxime	2-Ethylbutanol
Ethyl-b-ethoxypropionate	2-Ethylhexanal	Ethyl vinyl ether	2,5-Hexadiyn-1-ol
4,5-Hexadien-2-yn-1-ol	n-Hexyl ether	o,p-Iodophenetole	Isoamyl benzyl ether
Isoamyl ether	Isobutyl vinyl ether	Isophorone	b-Isopropoxypropionitrile
Isopropyl-2,4,5-trichlorophenoxy	n-Methylphenetole	2-Methyltetrahydrofuran	3-Methoxy-1-butyl acetate
2-Methoxyethanol	3-Methoxyethyl acetate	2-Methoxyethyl vinyl ether	Methoxy-1,3,5,7-cyclooctatetraene
b-Methoxypropionitrile	m-Nitrophenetole	1-Octene	Oxybis(2-ethyl acetate)
Oxybis(2-ethyl benzoate)	b,b-Oxydipropionitrile	1-Pentene	Phenoxyacetyl chloride
a-Phenoxypropion	Phenyl-o-propyl ether	p-Phenylphenetone	n-Propyl ether
n-Propyl isopropyl ether	Sodium 8-11-14-icosatetraenoate	Sodium ethoxyacetylde	Tetrahydropyran
Triethylene glycol	Triethylene glycol dipropionate	1,3,3-Trimethoxypropene	1,1,2,3-Tetrachloro-1,3-butadiene
4-Vinyl cyclohexene	Vinylene carbonate		

¹ R.J. Kelly, "Review of Safety Guidelines for Peroxide-Forming Organic Chemicals", Chemical Health & Safety, September/October 1996



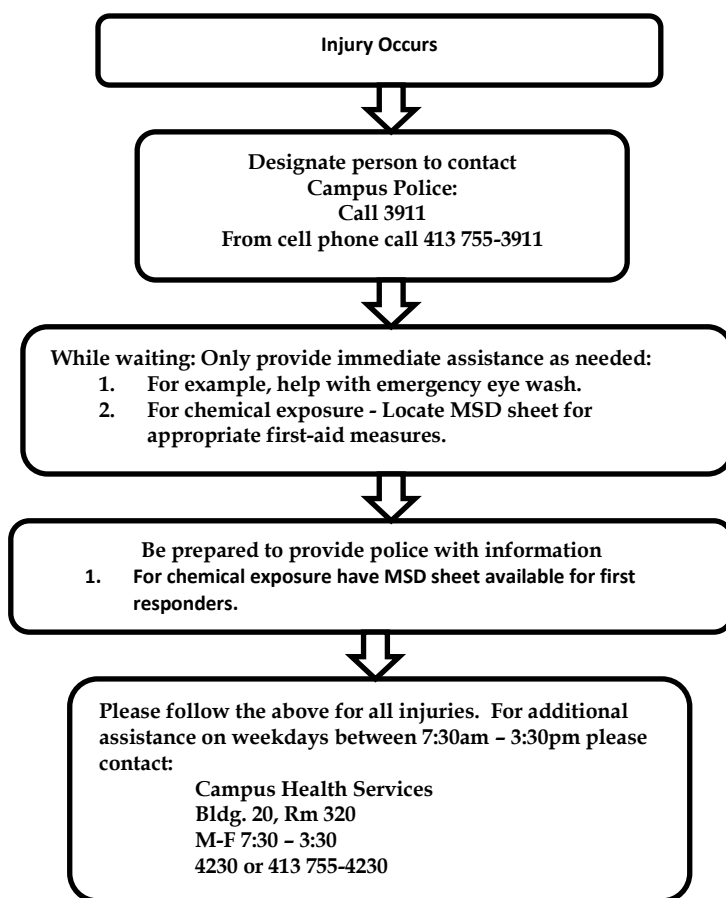
Injury to Student or Faculty/Staff Member

Science and Engineering Transfer Standard Operating Procedure (revised 04/15)

For questions about this document, please contact the office of the Dean for Science and Eng. Transfer at 755-4576.

The following is a general guideline to situations where a student or employee is injured in a classroom or laboratory situation within the School of Science and Engineering Transfer. Conditions within other work areas at the college may differ and the operating procedures contained in this document may not apply. This is also intended to be a general guide for how to respond and is not a first aid guide. Except in extraordinary circumstance it is best to rely on Campus Police (3911 or 413 755 3911) or Campus Health Services (4230 or 413 755 4230) for first aid.

Flow Chart for Basic Injury Response. Please see pg. 2 for additional information.



Basic Injury Response:

- For any situation requiring basic first aid, students and employees should be referred to Campus Health Services, Bldg 20, Rm 320 (4230 or 413 755-4230). Health Services are open M-F 7:30am -3:30pm. For after-hours, please contact campus police.
 - STCC employees should not attempt to provide first aid for students and should not transport students for medical purposes. If possible however, employees may want to consider accompanying a student to Health Services.
- For any medical situation where there is ANY concern that the person may need assistance including chest pain, shortness of breath, allergic reactions, fainting, nausea, internal pain such as abdominal pain, dizziness, chemical contact with skin or mucous membranes such as eyes and mouth, unintended inhalation of chemical vapors, obvious external injuries, bleeding cuts and related events:
 - Designate an individual to call 3911 (or 413 755-3911). If the injured person is in need of assistance it is best that the call be made by a second person and not the one providing assistance. The caller should be prepared to provide the STCC Police Emergency Dispatcher with location and a brief account of the victim's complaints, symptoms, or condition, if the person is unconscious, and the name of the chemical if one is involved.
 - Before providing assistance, assess the situation to ensure that you are not putting yourself in danger.
 - If there is chemical contact with skin, eyes, mouth or by inhalation, the faculty and staff should access the nearby Safety Data sheet (SDS) information on what immediate actions to take (for example, flushing with water) and assist the victim in taking that action, e.g. helping the person to the emergency shower or eye wash station.
 - Be prepared to provide the police with pertinent information on their arrival. STCC Police will arrive with quick access to additional first aid equipment (including defibrillators) and average a response time of less than 2 minutes, so it is best to call the police first. The police will be prepared to allow the person to sign a release if they do not want treatment. Even if a person does not want treatment it is still best to call the police, the individual may then decline treatment if they wish.
- Potential bloodborne pathogen exposure
 - If a person is exposed to potential infection from the bodily fluids of another person (either through mucous membrane contact or a penetrating skin injury such as a needle stick) Campus Police must be contacted even if the injury appears to be minor. The treatment window for response to potential infection is considered to be 3 hours, and so timely response is important.

Additional information

- In the case of injured students or work-study students, STCC Police will make a determination to call an ambulance, refer the student to the campus Health Service or recommend private care. In many cases someone from Campus Health Services will also respond and provide assistance. In most cases, expenses should be covered by their student health insurance.
- College employees should not attempt to transport a student for medical purposes.
- In the case of injured employees of the college, STCC Police will make a determination to call an

ambulance, or refer the person to additional care. In many cases someone from Campus Health Services will also respond and provide assistance.

- Employees referred to additional care will have a choice of their own provider or Concentra, the college's designated work-related care provider. The procedure is as follows:
 - The injured individual should notify Human Resources of the intent to seek care for work-related reasons.
 - HR contacts Concentra or other care-giver to alert them that this is work-related.
 - As soon as possible after incident, employee completes HR's Notice of Injury form (available in HR).

Concentra Medical
140 Carando Drive
Springfield, MA 01104
413 746 4006
M - F 8:00am - 5:00pm

SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

LABORATORY INCIDENT REPORT

Form must be submitted to STCC Police and Dean's Office within 48 hours

List the location of the incident: (Building and room number or other location)
Date and Time Incident Occurred:
Describe WHAT was being done at the time of the incident, HOW the incident occurred, and what Personal Protective Equipment (PPE) was used (name and amount of chemical if incident involved a spill/exposure. What: _____ _____ _____ How: _____ _____ PPE: _____
Was there an injury? <input type="checkbox"/> Yes <input type="checkbox"/> No Name of injured person _____ Phone Number of injured person : _____ Extent of injury (body part affected) _____
Was anyone exposed to a hazardous material? <input type="checkbox"/> If so, identify material and amount _____
Was person exposed to blood, saliva or vomit? <input type="checkbox"/> Yes <input type="checkbox"/> No If so, explain. _____ _____
Reporting Person's Name and Title _____ Personal Phone #: _____ College Phone #: _____ Department _____ Supervisor _____

Description of ANY action taken in response to the incident when it occurred:

Witnesses Names _____ Phone # _____

Witnesses Names _____ Phone # _____

Witnesses Names _____ Phone # _____

STCC Police contacted? _____ Health Services contacted? _____ Facilities contacted? _____

STCC Police 413-755-3911 or x 3911 * Health Services 413-755-4385 * Facilities 413-755-4700

*****DO NOT WRITE BELOW THIS LINE*****

This section is reserved for the person who conducts the follow-up investigation.

FOLLOW-UP RESULTS:

Name of Person who conducted follow-up: _____
Date this final follow up documentation is submitted for archives: _____
(Final follow up documentation should be submitted to the person(s) or department(s) to whom the original Incident Report Form was submitted.)
Name of person to whom this was submitted: _____

LABORATORY INCIDENT RESPONSE AND REPORTING PROTOCOL

If there is fire, explosion or toxic gas release:

PULL FIRE ALARM AND EVACUATE BUILDING

Contact STCC Police, 413-755-3911 or x3911, once in a safe location.

If there is an injury requiring medical attention:

Call STCC Police (413-755-3911 or x3911) and/or Health Services (413-755-4385).

If there is a minor spill:

- See definition below.
- Laboratory employee can clean up the spill or
- STCC Police (413-755-3911 or x3911) can be contacted to arrange clean-up.
- Provide the SDS to officers.

If there is a major spill:

- See definition below.
- STCC Police must be notified (413-755-3911 or x3911). They will contact the Fire Department or arrange for an outside contractor to clean up the spill.
- Provide SDS to officers.

Minor Spills

A minor spill is defined as a spill of material that does not pose an immediate significant threat to an employee's safety or the environment. If the spilled chemical is not a highly toxic material, is not spilled in large quantity, does not pose a significant fire hazard, and can be recovered before released to the environment it can be cleaned by laboratory personnel. STCC Police, **3911**, can be called if necessary to request professional assistance. STCC Police will contact the appropriate person(s) from the Emergency Contact List. Custodians are not permitted to clean up hazardous materials from a spill.

Major Spills

A major spill is defined as a spill of material that poses a significant threat to an employee's safety or the environment. Generally it involves a large quantity of a moderately hazardous substance, or any amount of highly toxic or particularly hazardous material, or any material that may present a fire hazard, or if the material cannot be recovered before being released to the environment. No attempt should be made to clean up a major spill. Everyone in the area must be notified, the area evacuated, and STCC Police contacted, 413-755-3911 or x3911. A meeting place must be determined at the time of the call so the caller can give details to STCC Police Officer(s). They will contact the Fire Department. In addition, STCC has a contract with an outside company responsible for the clean-up of major spills of hazardous materials and waste.

**IN THE EVENT OF AN EMERGENCY NOTIFY STCC POLICE 413-755-3911 or x3911 AND/OR
HEALTH SERVICES 413-755-4385**