

**PAUL SMITH'S COLLEGE
CHEMICAL HYGIENE PLAN**

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Chemical Lab Safety

Do:

- Keep only the amount of chemicals you need for the immediate job in the lab.
- Perform lab work in the lab, not in storage areas or other spaces.
- Store toxic substances in unbreakable containers. Keep them in a clearly marked, ventilated area.
- Position and clamp reaction apparatus thoughtfully, in order to permit manipulation without the need to move the apparatus until the entire reaction is completed.
- Combine reagents in the appropriate order.
- Wrap evacuated glass containers to protect against explosion.
- Check stored chemicals regularly for deterioration, broken containers, etc.
- Use adequate hand protection when inserting glass tubing into rubber stoppers or corks or when placing rubber tubing on glass hose connections.
- Store breakable containers in chemically resistant trays or over-wrap containers.
- Dispose of chemicals, broken glass, and other wastes in the containers specifically approved for that use.
- Clean up broken glass and spills immediately.
- Post signs to warn others of toxic hazards in the lab.
- Keep the lab clean and neat.
- Dispose of materials safely following the designated waste disposal procedure set forth in this program,
- Practice good personal hygiene in the laboratory.
- Know what to do in an emergency.

Don't:

- Don't store or consume food or beverages in an area where chemicals are used or stored.
- Don't use damaged glassware.
- Don't store chemicals near heat or sunlight, or near other substances with which they might react dangerously.
- Don't store chemicals anywhere other than in approved storage areas.
- Don't carry materials between lab and storeroom by hand. Use trays, racks, and carts.
- Don't pour chemicals down the drain.
- Don't store chemicals in hoods or on bench tops.
- Don't store materials on floors or other places where they create a tripping hazard.
- Don't keep chemicals that are no longer needed.
- Don't leave operating equipment unattended.
- Don't leave chemicals out at night - put them back in storage areas.
- Don't add solids to hot liquids.
- Don't fool around in the lab.
- Don't put custodians or fellow workers in danger - store and dispose of dangerous items like biological wastes according to procedures.
- Don't work alone when handling hazardous chemicals.

Basic Rules and Procedures When Working with Chemicals

Chemicals that are not properly handled can cause serious bodily injury and severe property damage. Skin contact with corrosive chemicals can cause ulcerated burns or dermatitis; inhalation, absorption, or ingestion of toxic chemicals can cause illness or death; flammable liquids and solids can cause sustained fires and/or explosions. Basic information such as boiling point, flash point, vapor pressure, toxicity, explosive limits, incompatibility of the chemicals used and the observance of the following procedures will greatly aid in minimizing the potential hazards involved in laboratory work.

- Treat any unfamiliar chemical as hazardous.
- Consider a mixture at least as hazardous as its most hazardous component.
- Do not use any unlabeled substances.
- Follow all chemical safety instructions to the letter.
- Keep Material Safety Data Sheets for each substance in use on hand in the laboratory.
- Never test chemicals by taste. Assume that all are toxic.
- To sample a gas by odor, fan some towards the nose with the hand after filling the lungs with air.
- Never pipette chemicals or start siphons by mouth.
- Keep stopcock firmly in place to avoid leakage on hands and arms when using a dropping or separatory funnel.
- When heating flammable liquids, use a water bath or an electric mantel. Do not apply direct heat or flame.
- Use exhaust ventilation hoods for chemical reactions involving toxic, aromatic, or obnoxious gases.
- Flammable chemicals which require refrigeration must be kept in an explosion proof refrigerator. Any refrigerator or walk-in cooler with ordinary lights, door switch, or internal regulator is NOT explosion proof.
- Photosensitive chemicals must be kept out of direct rays of sunlight.
- Used chemicals should never be returned to stock bottles.
- A compound that develops a gas by hydrolysis when exposed to air should not be tightly stoppered once it has been opened.
- Reagent bottles should be filled only to the shoulder in order to allow for pressure adjustments.
- Use a "safety carrier" when transporting corrosive liquids.
- Chemical spills should be handled appropriately. Don't take chances. When in doubt as to how to handle a chemical, ask!!! or, contact the following; Lab Coordinator, Science faculty, or Facilities, or make reference to the following:

Merck Index (Chemistry Lab Prep Room).
Manufacturers Safety Data Sheets.

Standard Operating Procedures

Purchasing

All chemicals purchased or brought into campus labs must have the prior approval from the department head. Before any approvals are made he/she will require approval from the Lab Coordinator who will make every effort to determine that the chemical or procedure is the least hazardous that can be used in each situation. Every effort will also be made to limit on-hand inventory to a one-semester stock.

The applying scientist must also demonstrate that provisions have been made to dispose (when applicable) of any waste chemicals in accordance with the approved procedures of Paul Smith's College.

All chemicals are purchased by the College's Purchasing Agent.

Purchasing Procedure

- A purchase requisition along with acceptable disposal statement (when applicable) is submitted to the Lab Coordinator for verification of inventory.
- Upon verification of both items, the request form is forwarded to the appropriate dean for approval and then submitted to the purchasing agent.
- Orders received are delivered to the lab Coordinator for inventory, MSDS and labeling compliance.
- Once the order has been confirmed the faculty member requesting the item is notified.

Waste Handling Practices

Chemical wastes generated by College laboratories, shops, and custodial services as well as abandoned reagents, outdated medical and art supplies, solvents, thinners, oils, cleaning fluids, and their containers shall be identified, labeled, packaged and disposed of in compliance with regulations of the New York State Department of Environmental Conservation, the U.S. Environmental Protection Agency (E.P.A.), and the Department of Transportation (D.O.T.). This will be done under the direction of the Facilities Department.

Collection and Segregation

- A Collection station (accumulation point) for hazardous wastes has been set up in the laboratory hood located in Room 101 in the Freer Science Building.
- The proper disposal methods as stated on the Material Safety Data Sheets for each substance will be followed.

Identification and Labeling

- The Laboratory Coordinator will ensure all hazardous and regulated wastes are properly labeled. Once material is declared waste, labeling is the most important component in assuring proper disposal. All waste chemical containers must be labeled with hazardous waste or regulated waste labels.

Transfer

- When necessary the Laboratory Coordinator will call the Facilities Department for waste removal. The Facilities Department will call the contractor. No waste will be transferred from the laboratory hood by any College personnel. The contracted vendor will remove and transfer all wastes.

Engineering Controls and Personal Protective Equipment

General Procedures

- All precautions listed in the section titled "Precautions for Safe Handling and Use" on the Safety Data Sheet will be followed.
- All container transfers involving chemicals classified as corrosive, flammable, toxic, or carcinogenic will be made in an operating fume hood with the door raised to a level no higher than the 100 FPM mark.
- Personal protective equipment available will consist of gloves, goggles, aprons and dust masks.
- The Lab Coordinator will insure that proper housekeeping practices are followed and maintained.
- All lab reagents taken from stock will be distributed in volumes of less than 500 milliliters (ml).
- Only faculty and staff will handle stock bottles and distribute reagents.

Designated Areas

Work being conducted using any chemical classified hazardous, highly toxic, acutely toxic, reproductive toxic, or carcinogenic will be performed in an operating fume hood or in an area designated by the laboratory coordinator. This area will be segregated from the rest of the lab.

Personal Protective Equipment

- All protective laboratory equipment will be maintained by the Lab Coordinator. Gloves, aprons, eye protection, dust masks, and any other needed personal equipment will be maintained by their individual lab.
- Emergency eyewash and shower stations will be clearly marked and centrally located.
- Any problems with personal protective equipment or equipment controls will be reported immediately to Facilities for immediate repair or replacement.

Equipment Controls Tests and Maintenance

- Laboratory fume hoods are tested yearly for FPM adjustment and tagged as such. If fumes or vapors escape from the hood, stop chemical work immediately. Call the Laboratory Coordinator or Facilities. Report your problem and where it is occurring. A record of the identity, location and status of all fume hood fans is kept at the Lab Coordinator's office and updated as needed.
- Chemical storage cabinets will be locked and under the control of faculty and staff at all times.

Emergency Procedures - Chemical Spills/Fire/Explosion

Spill Procedures

- If in doubt, leave the bottle or carton right where it falls. Don't touch it with bare hands. (Wear rubber gloves when cleaning up corrosive materials).
- Obtain all information possible such as the name of the product, the manufacturer, the address and phone number. The name of the chemical may be the trade name or the actual chemical name. Make certain it is spelled correctly.
- If spilled material is flammable, immediately shut off all electrical heating units and open flames within the area. Liquids may be flammable. Do not permit open flames or cause sparks by turning lights on or off. Shut off all motors and open flames and leave off.
- Use exhaust hoods to ventilate room. Avoid breathing fumes. If respiratory protection is required because concentrations are questionable or offensive, call for the Lab Coordinator.
- Call the Lab Coordinator to report a chemical spill. Provide the information that is known. In the absence of the Lab Coordinator, contact Facilities or Campus Safety. (Facilities x6438, or Campus Safety x6300).

Spill Kits

- Each lab is equipped with a spill kit containing the following items:

Universal Absorbent
Eye protection
Nitrile Gloves

Clean Up

- The Lab Coordinator will supervise incidental spills only. In the event of a non-incidental spill the cleanup will be turned over to an outside contractor. The contractor currently being utilized for spill Response is OPTECH Environmental Services, Inc. **The OPTECH Emergency Spill Response Phone Number is 1-800-225-6750.**

Summary of Spill Procedures

- Notify the Lab Coordinator or alternate spill responder. The Lab Coordinator will supervise incidental spills only.
- Leave broken bottles and cartons where they fall.
- Wash chemicals off skin with water - immediately.
- Chemicals splashed on clothing - remove and wash immediately.
- Ventilate area. Turn off hot plates and any powered equipment which may produce a spark.
- Evacuate all personnel in the affected area.

*** Warning: Treat all liquids as flammable and corrosive.**

During the day, call the Lab Coordinator and report the spill or release. After 5:00 p.m. or on weekends, call Campus Safety (327-6300). Campus Safety will notify the alternate spill responder. Be prepared to give the proper information about the spill, such as chemical name, quantity spilled, location, and any other pertinent information.

Warn others in the area of the spill or release. Evacuate the immediate area. Shut off all electrical devices and extinguish any open flame heat sources if material is flammable.

Fires and Explosions

Small fires that can easily be extinguished without evacuating the building or calling the fire department are among the most common laboratory incidents. Actions to be taken in case of a small laboratory fire are:

- Alert other personnel in the laboratory and send someone for assistance.
- A fire in a small vessel can often be suffocated by covering the vessel with an inverted beaker or a watch glass.
- Avoid entrapment in a fire.
- If there is any doubt whether the fire can be controlled by locally available personnel and equipment, the following actions should be taken:

 Activate the alarm system;

 Confine the emergency (close hood sashes, doors between laboratories and fire doors) to prevent further spread of the fire;

 Assist injured personnel; and

 Evacuate the building to avoid further damage to personnel.

- In case of explosion, immediately turn off burners and other heating devices, stop any reactions in progress, assist in treating victims, and evacuate the area until it has been decontaminated.

Accident and Emergency Reporting

All accidents or emergencies will be reported immediately to:

- Lab Coordinator
Kelly Linehan
Freer Science Building Room 112 ext 6333
- Director of Campus Safety
Campus Safety Building, x6300
- Director of Facilities
Facilities Bldg, x6438

First Aid

Eye Contact

- Eyes contaminated with chemicals should be immediately flushed with plenty of water for at least 15 minutes and reported to the College Health Services. Eye wash stations and emergency showers are located in each lab. Pursue medical attention through the local emergency room.

Skin Contact

- If the words ACID, CAUSTIC, or CORROSIVE appear, keep in mind that water in generous amounts must be used to wash these chemicals off the skin. Chemical spills on the skin should be immediately flushed away with copious amounts of water for at least 15 minutes.
- If irritation or pain persists, pursue medical attention through the local emergency room.

Clothing Contact

- If corrosive chemicals are splashed on shoes or clothing, the articles must be removed immediately. The area of skin under the clothing must be rinsed with large amounts of water. Shoes must be washed off under running water - use a brush or cloth to scrub the shoe. Articles of clothing must be submerged in running water and agitated to insure dilution of the chemical.
- If large areas of clothing are saturated the wearer must remove everything and rinse thoroughly under the safety shower.

Respiratory Contact

- Breathing fumes or dusts from spilled chemicals should be avoided. The vapors or dusts from many chemicals are irritating to mucous membranes, even in small amounts. Occasional short term exposure causes effects which last for only a few minutes. Some chemicals such as acids, chlorine, ammonia, and certain powders may cause tissue damage which will last for several days.

Provisions for Medical Evaluation Consultation

Paul Smith's College will provide employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations the examining physician determines to be necessary, under the following conditions:

- Whenever the employee develops signs or symptoms associated with a laboratory chemical exposure;
- When exposure monitoring reveals an exposure level routinely above the Action Level, or in the absence of an Action Level, the Permissible Exposure Limit for an OSHA regulated substance; and
- Whenever an event takes place in the work area (such as a leak or spill) which results in the likelihood of a hazardous chemical exposure. Paul Smith's College will provide specific exposure-related information to examining physicians (substance identity, description of exposure, etc.) Examining physicians will submit a written opinion to the College which discusses the findings of the examination.

Recordkeeping

- Paul Smith's College Human Resources Department will establish and maintain for each employee an accurate record of any measurements taken to monitor employee exposures and any medical consultation and/or examinations (including tests or written opinions). Records will be kept, transferred, and made available to employees or their representatives in accordance with OSHA's Access to Employee Exposure and Medical Records Standard (29 CFR 1910.20).

Employee Information and Training

Information

- The "Chemical Hygiene Plan" is on file in the Lab Coordinator's and Department Offices and the Facilities, Campus Safety and Risk Manager's Offices and on-line at www.paulsmiths.edu, Faculty and Staff Quick Links. Employees will be given information concerning prudent laboratory practices and be notified of the location of this document by email, the college's official form of communication
- Safety Data Sheets can be found in the Chemical Lab Prep Room or from the Lab Coordinator. Chemical suppliers must send SDS's with the initial purchase of the chemical substance.

Training

- Employees will be trained on the Chemical Hygiene Plan and made aware of any changes made on the plan during yearly revisions.
- Employees will be instructed on Paul Smiths College hazardous and regulated wastes procedures.
- The Lab Coordinator will maintain records of introductory training to new faculty and staff that have cause to use lab facilities, and will assure that facilities are kept up to date with compliance issues.

Chemical Hygiene Plan (CHP) Administration

The Chemical Hygiene Plan will be administered by the Chemical Hygiene Officer. The Vice President of Business and Finance or designee will act as the Chemical Hygiene Officer. The Chemical Hygiene Officer will be responsible for ensuring the CHP is adhered to by all affected personnel. The Chemical Hygiene Officer will review and update the CHP on an annual basis. Changes to the CHP will be conveyed to the Lab Coordinator who will ensure all affected personnel are informed of the changes.