Hudson Valley Community College

Chemical Hygiene Plan

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Chemical Hygiene Plan

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1.3 Laboratory Worker/Student

It is the responsibility of each Lab Worker/Student to abide by the general safety requirements set forth in the Chemical Hygiene Plan and as instructed by the Lab Faculty and Staff, as well as the specific procedures and requirements of the lab in which they work. Laboratory Workers/Students must realize that their actions may affect the safety of others.

Each chemistry lab student is required to read and sign acceptance of the "Safety Program for Chemistry Laboratories", included as Appendix A of this program.

Section 2 Prudent Experiment Planning

2.1 Responsibility for Experiment Planning

The proper planning of laboratory experiments is an essential component of lab safety. When planning a new lab experiment or process, the lab faculty will review and identify all potential hazards and determine proper safety precautions to be followed. This will also give the lab faculty an opportunity to determine if there are safer chemical substitutes that can be used in the experiment or process. Further, the planning process allows an opportunity to consider what hazardous waste will be generated and determine if there are ways to minimize the volume of hazardous waste generated. These steps can save the department money in purchase of chemicals as well as waste disposal costs, in addition to keeping the process/experiment as safe as possible.

Laboratory faculty member is responsible for identifying all the potential hazards of the experiments/processes they will be teaching or doing. They must communicate these potential hazards to their students and instruct them on safety precautions to be followed. Other department lab staff or the Environmental Health & Safety Department can assist in this process. At a minimum, the planning must ensure that all applicable health, safety and environmental regulations are followed as well as this Chemical Hygiene Plan and any other department specific procedures.

2.2 Planning Steps

While the format and degree of specificity included in the experiment planning process is entirely dependent upon the judgment of the lab faculty, once the goals and objectives of the experiment(s) have been clearly formulated, several aspects of the experiment process must be considered. These include:

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It is important that considerations for personal safety are an integral part of the planning process and are included in the evaluation of the goals and objectives of the laboratory work.

2.3 Chemical Management

As part of the experiment planning process efforts should be made to reduce both the quantity and degree of toxicity of the chemicals to be used. Successful source reduction efforts result in at least three beneficial factors:

- Minimization of the quantities of chemicals to be used
- Minimization of waste chemicals that require proper disposal
- Minimization of risk and future liability

The easiest way to help insure safety and the proper handling of chemicals and hazardous waste is to prevent the handling and generation of such wastes whenever possible. This requires meticulous experiment planning and a complete hazard assessment of the waste products that may be generated. Consider the following examples of waste minimization strategies:

- Micro-Scale: Whenever possible consider carrying out experiments and laboratory procedures on as small a scale as possible.

- Product Substitution: Whenever possible, substitute less hazardous chemicals in experiments. This might include alternate synthetic routes or procedures for working up reaction mixtures.

- Look at the "Big Picture": What may seem like a frugal purchase may, in the end, create an expensive liability. Consider the following example, based on actual chemical prices from a large manufacturer and actual disposal estimates. Professor X needs 1500 g of Ethyl Ether-Anhydrous for an experiment. Upon obtaining prices Professor X finds that 3 x 500g of the Ether costs $64.50, whereas 6x 500g costs $115.50, an apparent savings of $13.50 for the extra 1500 g. Although Professor X does not current 108 3ts ofclu0h Prxtz0 gs n

- Prevent Waste Commingling: Preventing non-hazardous chemicals from being mixed with hazardous chemicals will help to reduce the quantity of hazardous waste generated.

2.4 Acquisition and Inventory of Chemicals

The act of purchasing chemicals, and tracking their shelf life, is an important part of waste minimization and laboratory safety. Before chemicals are ordered several factors should be considered.

- The experiment(s) should be reviewed to determine the minimum quantity of the chemical(s) that is required to complete the necessary work.
- Fire codes, internal policies and regulatory restrictions may limit the amount of a certain chemical or group of chemicals that may be stored in a given area. This fact should be considered when ordering a quantity of a specific chemical.
- Some chemicals require special handling and storage once they have arrived. Some examples might include: refrigeration, dry box, freezing or storage away from light and/or moisture. Consideration must be given to special storage and handling requirements prior to chemical arriving.
- The stability of the chemical must be considered. Inherently unstable materials may have very short storage times and should be ordered on a "just in time" basis. Other materials may degrade to form explosive mixtures. These materials must be closely tracked in storage to identify signs of dangerous degradation. Some of these classes of materials are identified in Section 4, Chemical Hazards.
- The potential waste produced by the chemical and process in question should be considered from both a health and safety and a cost perspective.

Once a determination has been made for purchase of chemicals, the purchaser is responsible for ensuring that the chemicals are added to the department's or laboratory's chemical inventory listing. A Safety Data Sheet (SDS) for all chemicals purchased must be obtained and kept on file with all other SDSs for your department or lab.

If there are any questions or safety concerns about the potential use of a new chemical substance, the Director of Environmental Health & Safety (EHS) should be contacted.

2.5. Donated or Otherwise Acquired Chemicals

It is the College's policy that no chemicals can be brought onto College property that have not been purchased by the College department or otherwise received prior approval of the Department Chair. All of the above considerations described in Section 2.4 apply to donated or otherwise acquired chemicals and an SDS sheet must accompany the chemicals when allowed to be brought onsite by the Department Chair. These chemicals become the responsibility of

the College’s once on College property and must be used, stored and handled the same as all other chemical products.

Section 3 General Lab Safety Principles/Standard Operating Procedures

3.1 Basic Laboratory Rules

- Do not work alone in the laboratory.
- Smoking, eating, drinking, the application of cosmetics and contact lens insertion or removal is not permitted in laboratory preparation areas or in areas where chemicals are used or stored. Chemical vapors can be absorbed by foods, especially breads and tobacco.
- Food or drink for human consumption is not permitted to be stored in the laboratory areas.
- Never mouth pipette or start a siphon by mouth

3.2 Personal Hygiene and Conduct

- Use good personnel hygiene. Keep hands and face clean. Wash hands frequently with soap and water to minimize chemical exposure through ingestion and direct contact with skin. Always wash hands before eating, drinking, smoking, applying cosmetics or handling contact lenses after working in the laboratory.
- Confine long hair and loose clothing.
- Avoid behavior which might confuse, startle, or distract another worker.
- Report dangerous activities or situations and unsafe conditions.
- Report any accidents or exposure incidents. Report aepo xo [illegible]

3.4 General Housekeeping

- Keep work areas clean and uncluttered.
- Clean work areas and return equipment and supplies to proper storage areas at end of work day.
- All broken glass should be immediately disposed of in the glass waste containers provided.
- Do not ignore wet areas on floors – dry to prevent falls.
- Clean all minor spills promptly.
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Section 4 Chemical Hazards

4.1 Chemicals pose both health and physical hazards

According to OSHA, physical hazard means "a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water reactive."

According to OSHA, health hazard means "a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term health hazard includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins,

metals, or when the chemical dries out.

If you suspect your oxidizer or organic peroxide has been contaminated (evident by discoloration of the chemical, or if the

4.1.8 Unstable (Reactive) or water reactive chemicals

Reactive chemicals, whether they are a water reactive, air reactive, or unstable in nature, must be handled with extreme care. SDS Sheets should be carefully reviewed to verify safe handling procedures for specific chemicals/compounds. Laboratory working involving reactive chemicals should be completed in fume hoods or glove boxes. Reactive chemicals should be stored such that proper compatibility is insured and conditions such as temperature and sunlight are maintained within safe limits for each specific type of chemical. Refrigerators used for storing flammable or reactive chemicals should be explosion proof. Standard Operating Procedures

4.1.12 Toxic Chemicals

Toxins affect particular target organs. Target Organ Effects is Chemically caused effects from exposure to a material on specific listed organs and systems such as liver, lungs, and central nervous system. Chemicals can have adverse effects, acute or chronic, on many different organs of the body as a result of exposure. A wide range and diversity of effects and hazards can be found in the workplace. The following chart illustrates the broad scope which may be encountered.

PHYSIOLOGICAL CLASSIFICATION	TARGET ORGAN(s)	SIGNS & SYMPTOMS	EXAMPLE CHEMICAL(s)
Hepatotoxins	Liver	Jaundice; liver enlargement	Nitrosamines; 1-Propanol
Nephrotoxins	Kidney	Edema, proteinuria	Halogenated hydrocarbons; cumene; hexane
Neurotoxins	Nervous system	Narcosis; behavorial changes, decrease in motor functions	1-propanol, Mercury compounds
Agents that act on blood or hematopotic system	Decrease hemoglobin function; deprive body tissues of oxygen	Cyanosis; loss of consciousness	carbon monoxide; cyanides; acetonitrile
Reproductive toxins	Chemicals that effect the reproductive capabilities; including: mutations and affects on fetuses (teratogenesis)	Birth defects; sterility	Lead; nickleous chloride; hexane
Agents that damage the lung	Irritate or damage the pulmonary tissue	Cough; tightness in chest; shortness of breath	Silica; asbestos; Thionyl chloride
Cutaneous hazards	Affect the dermal layer of the body	Defatting of the skin; rashes; irritation	Ketones; chlorinated compounds
Eye hazards	Affect the eye or visual capacity	Conjunctivitis; corneal damage	Organic solvents; acids; aluminum nitrate; Crystal violet; Fast violet B salt

The SDS of a chemical will list both the known physical and health hazards of that substance. You must review SDS sheets and other reference materials before initiating work with all unfamiliar chemicals. Toxic materials should be opened and handled only within a functioning ventilation enclosure, such as a laboratory hood, unless alternate work practices can achieve an equal or greater level of personal protection. Generally speaking, there are several safety

- Inhalation: Perform chemical manipulations involving toxic materials in fume hoods and/or where adequate ventilation exists. If respiratory protection is required, you must have received appropriate training, fit-testing and medical surveillance through the EHS Department first.

- Ingestion: Practice appropriate hygiene in the laboratory. Wash your hands often; keep surfaces clean of chemical residue, and never eat, drink or smoke in the laboratory.

- Injection: Be mindful of broken glass and sharps hazards. Dispose of contaminated sharpsne mepriat v pric m002 Twe con

The Ehs Department must be notified of intended use of any of these materials prior to their introduction into the workplace. In addition to this list, there are other known or suspected carcinogens listed by other independent agencies. Consult the SDS for potential carcinogenicity of any substance you are using.

4.2.2 Reproductive Hazards

Chemicals that are collectively referred to as reproductive hazards cause a diverse group of harmful effects and in varying degrees. They can affect both male and female reproductive abilities, cause chromosomal damage (mutations), and can have an effect on pregnancy and the stages of fetal development (teratogenesis - physical defect manifestations) such as malformations and/or death. Many chemicals found at the College and commonly used in most workplaces exhibit some degree of reproductive hazard.

4.2.3 Other substances that exhibit a high degree of acute toxicity

Some chemicals can cause serious, adverse health effects immediately upon contact. A careful review of the toxic effects section of the SDS is necessary in identifying such substances. For example: hydrofluoric acid used in the SMT Lab at TECSMART.

Additional safety precautions when working with particularly hazardous substances should be developed. Consult with the Environmental Health & Safety Department (EHS) in developing and implementing appropriate precautions.

4.3 Chemicals or Substances of Unknown Hazard

In some cases a chemical's toxicity and overall data for hazards is incomplete as stated on the SDS. In these cases the substance must be assumed to be hazardous and appropriate exposure control measures taken for the tasks involved fume hood, gloves, goggles, etc.

Any unknown by-product of a procedure must be considered as a hazardous chemical.

Any unlabeled substance encountered must be considered to be hazardous

4.4 Assessing Chemical Hazards

Safety Data Sheets list chemical properties which can help the user to determine the hazards of the chemicals they are using. It is important to know and understand the terms used to describe these properties in order to recognize these hazards. Some of the key terms encountered on the SDSs are explained in this section.

4.4.1 Vapor Pressure

What is a vapor?

As temperature rises more of the liquid evaporates. Vapor pressure is the measure of how much of the liquid evaporates to form a vapor. It actually is a measure of the tendency of the liquid to form a vapor at a given temperature. Typically vapor pressure is measured in millimeters of mercury (mmHg), the same unit of measure as weather atmospheric pressure.

Why is vapor pressure important?
Chemicals with high vapor pressures will vaporize more readily than ones with low vapor pressure. Acetone has a high vapor pressure. High vapor pressure means the chemical is more likely to contaminate the air, and thus more of the vapor may be inhaled by people in the area.

Examples:
High: A vapor pressure above 10 mmHg (millimeters of mercury) at room temperature.
Benzene (75 mmHg)
Acetone (266 mmHg)
Moderate: A vapor pressure between 1 and 10 mmHg at room temperature.
Turpentine (5 mmHg)
Nitric acid (10 mmHg)
Low: A vapor pressure of less then 1 mmHg)
Sulfuric acid (0.001 Hg)

What are the hazards of high vapor pressure?
- Vapor pressure indicates which chemicals are more likely to get into the air and more easily

LOW fire risk

200°F

MODERATE
fire risk

100°F COMBUSTIBLE

SERIOUS FLAMMABLE
fire risk

What does the flashpoint tell you?

- High density vapors, both toxic and non-toxic, collect in low areas and confined places and displace the oxygen that is there. If enough oxygen is displaced, you could suffocate.
- Therefore, a dense vapor of even a non-toxic chemical can be extremely dangerous.
- High density vapors can travel far from their liquid source and sink into areas where you might not expect to find them, especially when the air is very still (no mechanical ventilation) The concentration of toxic vapors in low-lying or confined spaces may be very high.
- High density vapors typically are also flammable. [illegible]

4.4.6 Fire and explosion hazards

In order for a fire and explosion to occur three things are needed.

- Oxygen
- An ignition source (flame, spark, or heat)
- Fuel (wood, oil, paper, chemicals, liquid, gas or vapor)

This is important to know because most fires can be extinguished if any of the three things is removed. Water can extinguish many fires because it removes the source of heat whereas foam or a dry chemical removes the oxygen by forming a barrier between the fire and the air.

Explosive (Flammable) Range: Lower and Upper Explosive Limits

- Fires cannot burn without a source of fuel.
- However, in order for the fire to ignite there must be a certain amount of fuel (chemical gas or vapor).
- If there is too little fuel the fire will not ignite.
- If there is too much fuel the fire will not ignite either. If there is so much fuel that it replaces too much of the oxygen there will not be enough oxygen remaining for the fire to burn.
- Fuels can ignite and keep a fire going when their concentration in the air is within a certain range called the explosive range
- The lower end of the explosive range is called the Lower Explosive Limit (LEL). Below the LEL there is not enough fuel to keep a fire going. Below the LEL the fuel/air mixture is, therefore, too lean to burn.
- The upper end of the explosive range is called the Upper Explosive Limit (UEL). Above the UEL there is too much fuel and too little oxygen to keep a fire going. Above the UEL the fuel/ air mixture is, therefore, to rich to burn.

LOWER Explosive H

between the periods. STELS must be balanced with much lower exposures during the day so the average exposure doesn't exceed the TWA. STELS are not available for all substances.

- Ceiling (C) limits are concentrations that must never be exceeded during any part of the day.
- Action levels are found only in certain substance specific standards by OSHA. This is the air concentration that triggers a series of actions the employer must take to protect the employee. Action levels are typically one half of the permissible exposure limit.
- A "SKIN" notation that follows the exposure limit indicates that a significant exposure can be received if the skin is in contact with the chemical in either the gas, vapor or solid form.

Units of Measurement

A workplace exposure level, such as a PEL or TLV, is expressed as the concentration of the air contaminant in a volume of air. The most common units are:

ppm	parts per million (the number of "parts" of air contaminant p million parts of air)
mg/M^3	

Section 5 Control Measures and Safety Equipment

Chemical safety is accomplished by awareness of the chemical hazard and by keeping the chemical under control through a variety of engineering controls, work practice (administrative) controls, and Personal Protective Equipment. Laboratory personnel should familiarize themselves with these safeguards. OSHA dictates that engineering and work practice controls initially be used to reduce employee exposure below the PEL.

5.1 Engineering Controls

Engineering controls are physical or mechanical systems installed in the laboratory that are designed to reduce or eliminate employee exposure to chemical and physical hazards in the workplace. They must be maintained in .7(e)-4.7(e(i-2.9(ls66 Tm (.5(n)r557(e(i-2((d)-5.10.7(a)-7.4(t)17)]TJ 06ny-7(n)-026(d)-c -0.00T

Fume hood maintenance

The EHS Department coordinates annual testing and inspection of fume hoods on campus. After each inspection, an inspection sticker is affixed to the fume hood. If your fume hood does not have an inspection sticker or if the existing inspection sticker on your fume hood indicates a year or more has passed since the hood was last inspected, then please call EHS Department (629-7163) for air flow measurements or other questions.

5.1.3 Biosafety Cabinets

Biological safety cabinets (BSCs) are engineering devices that reduce the risk of working with biohazardous and infectious microorganisms. Cabinets are also used for maintaining aseptic conditions when working with cell cultures. BSCs utilize High Efficiency Particulate Air (HEPA) filters in the supply air and exhaust systems to create a nearly sterile work environment. Thus, BSCs provide personnel,

5.2 Other Control Measures and Safety Equipment

5.2.1 Portable containers

Flammable liquids should be kept in approved, portable containers specifically designed and allocated for flammable liquids (commonly called safety cans). These containers will have a UL approval label, or

information on how to use a fire extinguisher is posted on the EHS and Public Safety websites and included in lab safety training for faculty.

Any fire extinguisher that has been used at all, even if it wasn't fully discharged, needs to be reported to Public Safety for two reasons: the fire must be reported and a replacement fire extinguisher can be provided in place of the one used.

See the Resources Page in Appendix B for more information on fire safety and how to use a fire extinguisher.

Section 6 Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE)

6.5 PPE Training

Section 7 Chemical Waste Disposal

Hazardous chemical waste storage and disposal is regulated by the U.S. Environmental Protection Agency (EPA) and in New York State by the Department of Environmental Conservation (DEC). All chemical wastes are subject to inspection and enforcement actions by the EPA and DEC.

7.1 Waste Determination

The first step in properly handling chemical waste is to determine whether it must be segregated from the normal waste for disposal, based on its hazardous characteristics. Before disposing of any chemical waste or product by sink or trash, this waste determination must be made. Questions to answer in determining if a waste product is hazardous include:

- Is it flammable or combustible?
- Is it corrosive to other materials or skin?
- Will it undergo spontaneous chemical reaction or react violently with air or water?
- Does it present a health hazard to humans?

The SDS will aid in answering these questions. If one or more of these properties are exhibited, the Environmental Health & Safety Department must be contacted for further evaluation and a determination of the proper disposal method. When in doubt, contact EHS for assistance.

Most materials used in the labs have been assessed and a waste determination made. Materials that must be segregated from the regular trash or not disposed by sink have a waste container provided for use by lab workers.

7.2 Hazardous Waste Container Requirements

Lab workers must be aware of and handle all hazardous waste according to the following requirements:

- Each waste container must be clearly marked “Hazardous Waste” and words that identify the contents
- Keep the containers in good condition, replace leaking ones
- Keep containers closed except when adding waste
- Inspect the containers for leaks and corrosion weekly
- Ensure the right waste is added to the container

Chemistry and Biology instructors can check chemical disposal methods on line: Blackboard BCP, course documents, technical services, select the appropriate work order.

Further specific instruction for hazardous waste handling in each department's lab areas are outlined in the Departmental Best Management Practices. Go to the Resources Page in Appendix E and click on the link to view the Best Management Practices.

7.3 Other Waste Segregated for Separate Disposal or Recycling

While not considered a "hazardous" waste under State and Federal environmental laws, the following types of materials must be collected for special disposal or recycling by the college

- Biohazardous materials
- CRTs (computer monitors and electronics)
- Scrap metal
- Used oils
- Fluorescent & other specialty bulbs, batteries, and mercury-containing articles

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Section 8 Emergency Preparedness

FOR CAMPUS EMERGENCY ASSISTANCE
DIAL 911 FROM A CAMPUS PHONE
OR518-629-7210 FROM A CELL PHONE

8.1 College Campus Preparedness

Numerous categories of emergencies can occur: bomb threat, civil disturbance, fire, hazardous material, road closing, medical, weather, etc. The college has established a College Emergency Preparedness Plan which covers major emergency preparation. There is also basic emergency information for all staff and students available through the HVCC web page.

To link to the HVCC Emergency Preparedness

GO IMMEDIATELY TO THE HVCC HEALTH OFFICE, 2nd FLOOR, CAMPUS CENTER OR THE EMERGENCY ROOM

- If possible, bring the Safety Data sheet or information on what you believe you were exposed to.

8.3 Fire Emergencies

The college maintains and tests fire extinguishers, fire alarms and suppression systems. Fire drills are conducted three times per year. Employees should know the location of fire alarm pull stations and emergency phones. These are usually found in the hallways (egress paths) and building exits. If an employee observes smoke or fire, they can use a fire extinguisher if it is safe to do so. First, notify others of the fire by pulling the fire alarm. If one extinguisher does not eliminate the fire, or if it is not safe to use an extinguisher, evacuate the building immediately and report details of the fire to Public Safety or other emergency responders. If an extinguisher is used under any circumstances, report this to Public Safety after the emergency is over so that the extinguisher can be serviced.

8.3.1. Evacuation Procedures

Evacuation plans are posted in classrooms and hallways, directing the occupants to the nearest evacuation routes. Follow these procedures when evacuating:

- Secure hazardous materials (e.g. close bottles) and turn off equipment

8.5 Chemical Spills and Accidents

When a hazardous material is spilled, the faculty member or employee in charge in the lab will first determine if any injury has occurred and ensure the safety of the students. The identity of the spilled material and amount will be determined so as to assess whether this is a small, incidental spill that can be handled by faculty or employees in the immediate area, or whether it is a large spill, requiring outside assistance.

8.5.1 Incidental Spills

A spill is incidental if:

- The spill is a small enough quantity of a known chemical that it is not posing an acute health hazard.
- No gases or vapors are present that require respiratory protection
- It can be adequately cleaned up using the spill cleanup materials on hand
- You have the necessary personal protective equipment available.
- You understand the hazards posed by the spilled material and can follow the spill kit directions to conduct the clean up

Procedures for small, incidental spill cleanups:

- Clear the area by removing all students

Secton 9 Information and Training

Laboratory employees are provided with information and training to ensure that they are informed of

general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures (e.g., firefighting). This information should be helpful to those that need to get the information quickly. Sections 9 through 11 and 16 contain other technical and scientific information, such as physical and chemical properties, stability and reactivity information, toxicological information, exposure control information, and other information including the date of preparation or last revision. Additional information on SDSs can be found in Appendix B.

Each College department maintains a listing of all chemicals used or stored in the department and their associated SDS in the online MSDSOnline database.

Instructions and links to access MSDSOnline are found on the Environmental Health & Safety website. Backup copies for emergency access are kept on flash drives by Technical Services, Public Safety, EHS and Health Services. Hard copy SDSs for the Biology, Chemistry and Physics chemicals are maintained in the SCI 200 Faculty Room by Technical Services.

Chemicals listings and SDSs are updated as changes are made and are verified annually.

9.3.2

full and are being transferred to the designated waste storage area for pick up by the College's hazardous waste vendor.

Section 10 Exposure Evaluation & Medical Consultations

10.1 Exposure Evaluation

Any complaint of odors, chemical exposure or other health/safety conditions should be brought to the attention of the EHS office. The EHS Department will further investigate and conduct any appropriate follow up air monitoring and workplace evaluations. Employees reporting the complaint and their supervisor will be kept fully informed of the evaluation and findings.

10.2 Medical Consultations

The College will provide laboratory employees an opportunity to receive medical attention and any necessary follow-up examinations under the following circumstances:

- An employee exhibits signs or experiences symptoms associated with exposure to a hazardous chemical in the laboratory.
- Where air monitoring reveals that an employee is routinely being exposed above the Action Level or

- A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment.
- The written opinion shall not reveal specific findings of diagnoses unrelated to the occupational exposure.

Section 11 Records and Recordkeeping

The College will maintain for each employee an accurate record of any measurements taken to monitor employee exposures and any medical consultation and examinations including tests or written opinions required by the OSHA Laboratory standard.

11.1 Air Monitoring Records

Air monitoring records include workplace air monitoring, biological monitoring, safety data sheets or any records that reveal the identity of a hazardous substance. Monitoring records are maintained by the EHS Department.

11.2 Chemical Inventory Records

SDS

Section 12 Annual Reviews of the Chemical Hygiene Plan

APPENDIX A

SAFETY PROGRAM FOR CHEMISTRY LABORATORIES

INTRODUCTION

verbal instructions must be followed. No unauthorized experiments are allowed. Special safety precautions, such as the use of ventilation (fume hoods), must be followed. Chemical wastes must be disposed of properly and all accidents (e. g. significant spills, broken glass) or injuries must be reported to the instructor.

PART II - GENERAL SAFETY POLICIES AND PROCEDURES

Chemical compounds can be hazardous. Some are irritating to the skin or other body tissue. Others may have disagreeable odors and/or hazardous vapors. Many are flammable and some are explosive. Many are poisonous if ingested. Consequently all chemicals should be handled with caution, and thoughtful consideration must be given to their safe use. With due precautions, chemists have lived long and productive lives even when working continuously with or near hazardous materials. Therefore, you should understand and practice these precautions.

ANTICIPATING AN EMERGENCY

1. Learn the location of the eye-wash and emergency shower. Know how to operate the eyewash, even with your eyes closed.
2. Learn the location of, and how to use the fire blanket.
3. Learn the location of the nearest exits from the laboratory, and consider the shortest and quickest route by which to leave the building.
4. Learn the location of the emergency telephone.
5. Learn the location and operation of the fire extinguisher. Most extinguishers are dry chemical, but some are carbon dioxide. Note that extensive use of a CO_2 extinguisher on a person can cause frostbite. Extinguishers should be aimed at the base of flames.
6. Keep a cool head in accidents; panic never helps - think situations through.

PERSONAL PRECAUTIONS

1. Wear eye protection at all times in the laboratory. Chemical splash goggles are required by state law. You must also wear gloves and a lab coat when handling liquid chemicals. Contact lenses should not be worn in the laboratory. They can trap chemicals in the eye, and may be damaged by gases, vapors and fumes. If you have a medical condition that requires the wearing of contact lenses, inform your instructor, and always wear goggles.
2. Never eat, drink, or smoke in the laboratory. Furthermore, do not place objects in your mouth (e.g. pens, pencils) or wipe your eyes or face with your hands.
3. Be especially careful not to contaminate your clothing, books, or other personal belongings with chemicals. Students often carelessly place coats, textbooks, purses and other such items on laboratory benches contaminated with chemicals.
4. Never work alone; a minimum of 2 people familiar with lab safety should always be present.
5. Notify the instructor immediately in case of an accident, even if minor. (In the event the instructor is not immediately available, you can obtain assistance by using the emergency telephone located

18. Gas cylinders should be securely clamped to the laboratory bench and capped when not in use. Always use a cart when moving gas cylinders.

GOOD HOUSEKEEPING

1. Clean up any broken glass, chemical drips or leaks, or other debris. Brushes, dustpans, mops, sponges, etc. are either available in the laboratory or can be obtained from the stockroom.
2. Always weigh chemicals in a weighing bottle or other container to avoid spillage on balances.
3. Never return unused reagents to storage bottles. Ask your instructor how best to dispose of chemicals. They are usually placed in designated waste containers.
4. Replace stoppers or caps on the correct bottles.
5. Do not dip pipet into stock bottles. Pour some of the liquid into a beaker and remove the pipet aliquot from this solution.
6.

potential air contaminants on the inside of the lower part of the sash. For this reason the "stop" for the hood sash is set to a position that will ensure the flow rate is between 60 – 80 feet per minute.

2. When inserting and removing arms and objects into the fume hood, ensure that movement is parallel with the airflow direction. Avoid any scooping type motions. Avoid rapid removal of objects or arms from hood.
3. Set up apparatus as close to the back as possible. In no case should apparatus be closer than 6 inches (15 cm) from the door.
4. Don't block airflow. Raise large objects 2 inches (5 cm) off the counter by placing them on blocks. This allows airflow underneath and prevents stagnant areas.
5. Never store large quantities of chemicals in the fume hood. Chemical containers block airflow and create unnecessary hazards.
6. Since objects placed in the hood affect air flow, it is important not to "clutter up" a hood with extraneous items. No more than 50% of the available work surface should be covered with materials or equipment.
7. Hoods sashes should be fully closed when not in use. This conserves energy both winter and summer (when air conditioning is in use).
8. Never allow the area immediately in front of a fume hood in use to become a traffic area. Others walking by the hood face will adversely affect containment.

PART IV - PROPER LABELING AND HANDLING OF CHEMICALS

The majority of chemicals that you will use are already labeled, either by the supplier, or by Technical Services. However, you will be preparing solutions, and occasionally other materials,

C. Disposal Of Chemicals: Proper disposal of chemicals is important.

Most chemical wastes must be collected in special waste containers. There are limited exceptions, including dilute acids and bases that have been tested by the instructor and found to be in the pH range of 5.5 to 9.5. All other chemical wastes must be collected in special waste containers.

These waste containers will be provided by Technical Services and labeled by your instructor as to the type of waste (Acid, Base, Organic Solvent, Heavy Metals, etc.). Other chemical waste containers will be provided as requested by the instructor to ensure proper segregation of incompatible wastes

Each chemical shall be placed in the proper container according to Lab Waste Determinations and the directions of your instructor. All chemical contents must also be written on the container's waste label to ensure proper classification and treatment. These containers, once full or at the end of the semester, will be transferred to the Technical Services area for disposal by a hazardous waste contractor.

Do not dispose of chemicals in the trash along with paper products! Ensure that all waste containers are properly labeled and kept closed at all times when not be actively used. Take care to use the proper container for your waste. Follow the directions given by your instructor.

Waste containers in the chemistry lab are usually stored in the chemical fume hood and will look like this:

Your instructor will inform you of what waste container, if any, is needed for each experiment. As always, read the label on the waste container before adding your waste – not all chemicals are compatible with one another!

We appreciate your efforts to keep hazardous chemical waste out of the plumbing systems at Hudson Valley Community College. Assuring that chemical waste is collected is you doing your environmental duty!

APPENDIX B

RESOURCES PAGE

TOPIC	DESCRIPTION	LINK
Best Management Practices	Department guidelines for disposal of hazardous waste. Go to link and select HVCC department of interest	https://www.hvcc.edu/ehs/environmental/bmp/index.html
Biosafety Cabinets Safe Operating Practices		

	emergency, building evacuation plans, etc.	
GloveChemical Resistance Guide	FromAnsell	https://www.ansellpro.com/download/Ansell_8thEditionChemicalResistanceGuide.pdf
GloveSelectionGuide	From Oxford University	https://www.hvcc.edu W n BT /CS1 cs 0 0