2025

CHEMICAL HYGIENE PLAN FOR SANTA BARBARA CITY COLLEGE

SANTA BARBARA CITY COLLEGE

Santa Barbara City College Chemical Hygiene Plan

Table of Contents

Introduction

Santa Barbara Community College District is committed to providing a safe and healthful workplace and learning environment. This Chemical Hygiene Plan has been written with the goal of minimizing the exposure of staff, faculty, and students to chemical hazards in campus laboratories and is part of the overall Injury and Illness Prevention Program at Santa Barbara City College. It has been designed to meet the criteria of the Occupational Safety and Health Administration (OSHA) Laboratory Standard (29 CFR 1910.1450) and Title 8 of the California Code of Regulations, Section 5191, both titled, "Occupational Exposure to Hazardous Chemicals in Laboratories." (See **Appendix H** for a link to the complete text of the Laboratory Standard.)

While the federal Hazard Communication Standard applies to all operations using hazardous substances and has been designed to ensure that employees are provided with Safety Data Sheets (SDS), along with training and information regarding protecting oneself when handling hazardous materials, the Laboratory Standard was developed to provide protection more specific to laboratory settings, in which a wide variety of chemicals are used in relatively small quantities. These two standards will work in conjunction with each other.

Based on the definitions of laboratory, laboratory use, and laboratory scale (see **Definitions**), and as identified by Cal OSHA, Santa Barbara Community College District, has identified the following as areas that will be included under the Chemical Hygiene Plan:

- Life Sciences Division
- Physical Sciences Division

Santa Barbara Community College District, its Board, and its Management pledge to support this Chemical Hygiene Plan to assure that it remains a viable method of protecting all laboratory occupants. All District administrators, managers, employees, and students will be required to adhere to the policies and procedures set forth under this Plan. The District encourages all personnel affected by this Plan to provide constructive criticism to ensure that the Plan remains viable and effective, while meeting its intended goals.

Plan Availability and Review

The Chemical Hygiene Plan (CHP) will be readily available in the Physical Sciences and Life Sciences Division offices, the laboratory stockrooms of both the Physical and Life Sciences buildings, and the office of Risk Management. It will also be available on the College's website. The CHP will be reviewed annually by the Chemical Hygiene Officer, with input from appropriate faculty and laboratory technicians.

Chemical Hygiene Responsible Personnel

A brief overview of specific personnel responsibilities are as follows:

Santa Barbara City College School District

Ultimate responsibility for implementing the CHP rests with the Board of Trustees and the President. The District's duties include:

1. Designating a Chemical Hygiene Officer (CHO), an employee who is qualified by training or experience, to provide technical guidance in the development and implementation of the provisions of the CHP. This definition is not intended to place limitations on the position description or job classification that the designated individual shall hold within the employer's organizational structure**.**
2. Providing the CHO with the time, training, and resources necessary to fulfill their duties.
3. Ensuring that all employees receive training upon hire and continual training thereafter, in chemical hygiene and in the use of this document.
4. Promoting a strong health and safety culture.

Chemical Hygiene Officer

The Chemical Hygiene Officer is responsible for:

1. Reviewing the CHP annually, with input from the appropriate faculty and staff, to determine if the safety procedures, inspections, and recordkeeping outlined in this document are adequate and meet current regulations.
2. Performing annual laboratory and chemical storage area safety inspections and discussing with laboratory technicians, Department Chairs, and faculty the implementation of the chemical hygiene practices outlined in this document.
3. Reviewing (as needed) all activities that require prior approval under this plan (see Section 3).
4. Maintaining records of annual fume hood inspections, annual laboratory safety inspections, and chemical hygiene training.
5. Providing advice as needed regarding chemical procurement, use, and disposal to lab personnel and faculty.
6. Creating and revising chemical safety rules for the Physical and Life Science Divisions.

Physical and Life Science Division Chairs

Department Chairs are responsible for:

1. Promoting safe laboratory practices and adherence to the guidelines outlined in the CHP.
2. Notifying the CHO of any unsafe or non-conforming conditions as reported by appropriate faculty, staff, or students.
3. Allowing staff availability for required chemical hygiene safety training sessions.

4. Reviewing annual lab safety inspections with the CHO and addressing safety issues that need attention with the appropriate laboratory instructors and/or laboratory technicians.
5. Provide the CHP to any new employee within the department.

Laboratory Instructors

Laboratory instructors' duties include:

1. Adhering to the safety guidelines outlined in the CHP.
2. Requiring that students follow the safety guidelines outlined in the CHP at all times.
3. Reporting any unsafe laboratory conditions to the appropriate faculty, or staff, and CHO immediately.
4. Participating in chemical hygiene safety training.
5. Reviewing laboratory procedures and demonstrations for potential safety problems before putting them into practice.

Laboratory Technician

Laboratory technician duties include:

1. Following the guidelines outlined in this document and requiring all lab personnel, including student aides, to do so as well.
2. Maintaining an accurate inventory of laboratory chemicals, which should be updated annually.
3. Notifying the CHO of unsafe laboratory conditions or practices.
4. Completing monthly safety inspections, as outlined in **Appendix D**.
5. Consulting the CHO on activities that require prior approval.
6. Participating in chemical hygiene safety training.

Definitions

Action Level – A concentration designated in Title 8 of the California Code of Regulations for a specific substance, calculated as an eight (8)-hour time weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance.

Chemical Hygiene Officer – An employee who is designated by the employer, and who is qualified by training or experience, to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan.

Chemical Hygiene Plan – A written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment and work practices that (1) are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace and (2) meet the requirements of Title 8 of the California Code of Regulations, Section 5191 which can also be found in **Appendix H** of the CHP.

Combustible Liquid – A liquid which has a flashpoint of 140-200 degrees Fahrenheit.[9]

Corrosive - A substance that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact.

Flammable Liquid - A liquid which has a flashpoint below 140 degrees Fahrenheit.[9]

Flammable Solid – A solid that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard.

Flashpoint – The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite, as tested under conditions described by the American National Standard Method (ASTM) in the following documents: ASTM D 56-79, ASTM D 93-79, ASTM D 3278-78.

Fume Hood – A device enclosed on five sides with a movable sash or fixed partial enclosure on the remaining side; constructed and maintained to draw air from the laboratory and to prevent or minimize the escape of air contaminants into the laboratory; and allows chemical manipulations to be conducted in the enclosure without insertion of any portion of the employee's body other than hands and arms.

High Hazard Chemical – Solely for the purposes of this document, this is defined as a chemical that is rated by the Globally Harmonized System of Classification and Labeling (GHS) at category level 1 or 2 in any of the physical or health hazard classifications or, 3 or higher by the National Fire Protection Association (NFPA) in any of the categories of flammability, health, or instability.

Laboratory – A facility where the "laboratory use of hazardous chemicals "occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.

Laboratory scale – Work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials.

Laboratory use of hazardous chemicals – Handling or use of such chemicals in which all of the following conditions are met:

1. Chemical manipulations are carried out on a "laboratory scale";
2. Multiple chemical procedures or chemicals are used;
3. The procedures involved are not part of a production process, nor in any way simulate a production process; and

4. Protective laboratory practices and equipment are available and in common use to minimize the potential for employee exposure to hazardous chemicals.

Oxidizer – A chemical that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

Peroxide-Forming Chemicals – Chemicals that typically react with air, moisture, or impurities and produce a change in their chemical composition under normal storage conditions. The peroxides that form are less volatile than the solvent itself and thus tend to concentrate, creating a risk of explosion.

Pyrophoric – A substance that can ignite spontaneously when exposed to air.

Unstable Chemical – A chemical that is highly reactive with other chemicals and/or a chemical that is sensitive to shock or friction.

Water Reactive Chemical – A chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

References

1. Occupational Exposure to Hazardous Chemicals in Laboratories; California Code of Regulations, Title 8, Section 5191. http://www.dir.ca.gov/title8/5191.html.

2. Occupational Exposure to Hazardous Chemicals in Laboratories; 29 CFR 1910.1450. http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10106.
3. Control of Regulated Carcinogens; California Code of Regulations, Title 8, Section 5209. http://www.dir.ca.gov/title8/5209.html

4. Laboratory Fume Hood Requirements; California Code of Regulations, Title 8, Section 5154.1 http://www.dir.ca.gov/title8/5154_1.html.

5. Access to Employee Exposure and Medical Records; California Code of Regulations, Title 8, Section 3204. http://www.dir.ca.gov/title8/3204.html.

6. National Research Council, Prudent Practices in the Laboratory, National Academies Press, Washington, DC, 2011.

7. NFPA 704 Hazard Rating System, New Mexico State University Environmental Health and Safety Department, http://safety.nmsu.edu/programs/chem_safety/hazcom_NFPA_labels.htm.

8. Hazard Communication, California Code of Regulations, Title 8, Section 5194, http://www.dir.ca.gov/title8/5194.html.

9. Globally Harmonized System of Classification and Labelling of Chemicals, Occupational Safety and Health Administration, http://www.osha.gov/dsg/hazcom/ghs.html.

Section 1 – General Guidelines for Handling Laboratory Chemicals and Equipment

1. Read chemical labels and hazard warnings carefully before use. Refer to the Safety Data Sheet (SDS) specific to each chemical for detailed information regarding proper handling and personal protective equipment recommendations.
2. Skin and eye contact with chemicals should be avoided at all times. Minimize chemical exposure by wearing gloves and indirectly vented goggles. (See Section 4 for more details regarding reducing chemical exposure.) Inspect all protective wear before use.
3. One should assume that any mixture will be more toxic than its most toxic component, and that all substances of unknown toxicity are toxic.
4. Use a fume hood when working with volatile, flammable, or other high hazard chemicals.
5. Wear goggles and leather gloves when handling broken glass or when using heated glassware.
6. Never taste chemicals or eat or drink from laboratory glassware or other vessels.
7. Never use mouth suction to pipette chemicals or to start a siphon.
8. Chemicals should only be smelled indirectly by wafting the odors to your nose using your hand.
9. Do not eat, drink, chew gum, apply cosmetics, or store food or drink in areas in which chemicals are used or stored.
10. Wear appropriate clothing to offer maximum coverage, including long pants, shoes that cover the entire foot, and socks that cover the ankles are essential practices in maintaining a safe laboratory environment. Tie back long hair and secure loose clothing and jewelry.
11. Inspect all equipment before use. Do not use chipped, etched or cracked glassware.
12. Avoid working alone. If unavoidable, make contact with Campus Safety upon arrival and someone else in the department for periodic "check-ins".
13. No horseplay, practical jokes, or pranks are allowed in the laboratory.
14. Do not operate electrical equipment with wet hands. Ensure that electrical equipment is properly grounded before using it. Ensure all electrical equipment is turned off, unplugged, and stored properly in that sequence.
15. Keep all aisles clear with a 36 inch clearance and emergency exits unobstructed.
16. Know where emergency equipment is located and know how to use it properly before using any chemicals. Also be familiar with the campus emergency plan (see the SBCC Emergency Action Guides posted by the doors of each laboratory and stockroom) and building evacuation routes.
17. Keep work spaces, utility controls, and emergency equipment clean and within easy access.
18. Always label all chemical solutions, even those that will be immediately consumed in a reaction.
19. Dispose of waste promptly in the appropriate receptacle (see Section 11).
20. Wash hands carefully after all procedures and before leaving a laboratory or chemical storage facility even after wearing gloves.
21. Make sure any chemicals being autoclaved are safe to be autoclaved.

Section 2 – Guidelines for Handling High Hazard Chemicals

Chemicals considered highly hazardous, as defined for this document, are those which are classified as Category 1 or 2 health or physical hazards in the Globally Harmonized System (GHS) of chemical classification and labeling. This information can be found in Section 2 of the new GHS safety data sheets available for all manufactured laboratory chemicals. See **Appendix A** for an explanation of the GHS classification system. If a GHS safety data sheet for a chemical is not available yet, a highly hazardous chemical can also be defined as one having a rating of 3 or 4 in any of the National Fire Protection Association (NFPA) ratings for flammability, health, or instability. See **Appendix B** for a description of the NFPA ratings. Examples of highly flammable chemicals are acetone, alcohols, hydrocarbons, ethers, and some metals, such as potassium and sodium. Health hazards can include chemicals which damage the eyes or skin and those with acute toxicity, chronic toxicity, and reproductive toxicity. Highly unstable chemicals are those which are highly reactive with other chemicals and those which are sensitive to shock or friction.

Use and store high hazard chemicals in areas of restricted access. Label such work and storage areas with signs that indicate that highly hazardous chemicals are used or stored there. Only personnel with adequate training in the use of these chemicals should be permitted in these areas.

Minimize exposure by using a fume hood, appropriate gloves, indirectly vented goggles and possibly an additional face shield, a lab apron or coat, covered shoes, and long sleeves. Refer to the SDS of the chemical to determine appropriate protective equipment.

Flammable chemicals must be handled in areas free from sources of ignition, such as open flames, electrical equipment (especially those with motors, such as magnetic stirrers), and static electricity. Provide ventilation (such as through a fume hood) until the vapors are dilute enough to no longer be flammable. Use the smallest quantities possible and minimize exposure to air (such as avoiding open beakers).

It is highly recommended to have at least two people present in the work area at all times when high hazard chemicals are used.

Clean up work area thoroughly and immediately after use. Dispose of all waste in appropriate receptacles (see Section 11).

Meticulously clean non-disposable protective apparel and wash hands and forearms thoroughly with soap and water before leaving the restricted area.

Section 3 - Chemical Procurement, Distribution, and Storage

Chemical Procurement

Chemicals should only be obtained from reputable scientific supply companies and should only be received by the laboratory technician.

The decision to purchase a chemical requires a commitment to handle and use the chemical properly from initial receipt to final disposal.

Chemicals should be purchased in the smallest quantities possible to minimize waste and prolonged storage.

Whenever possible, both replacing hazardous materials with less hazardous options and decreasing the quantity of materials used in experiments is highly encouraged.

Manufacturer's labels must never be defaced or removed from original bottles containing chemicals.

SDS information for each chemical received is available electronically and may be stored in readily accessible binders.

The date of receipt of a chemical and the date the bottle was first opened should be written on all bottles.

An accurate inventory of all chemicals in storage must be maintained and updated at least annually by the laboratory technician. Unneeded or potentially deteriorated chemicals should be disposed of in a timely manner by following the proper disposal procedures outlined in Section 11.

Prior approval

Prior approval must be obtained from the Chemical Hygiene Officer when a chemical is added to a laboratory inventory that is considered highly hazardous, as defined in Section 2 of this document.

Prior approval must also be obtained from the Chemical Hygiene Officer when changes to a procedure significantly increase the potential for exposure to hazards, such as increased reaction rates, temperatures, or flammability.

Chemical Distribution

When liquid chemicals are transported from one place to another, they must be placed in secondary containers to safeguard against spills. Appropriate personal protective gear must also be worn at all times during the transport of hazardous chemicals (see Section 4).

When a chemical is transferred from its original bottle into secondary dispensing containers, these containers must have labels that include the proper chemical name (not just the chemical formula),

concentration, and GHS pictograms for hazardous properties it may contain. The dispensing containers must be labeled prior to the transfer of the chemical.

Chemical Storage

The following information is intended as a general guideline for basic "groups" or "families" of chemicals and should be used in conjunction with the appropriate SDS information.

Chemicals should be stored in a secure location with limited access monitored by the laboratory technician. Laboratories should only be used for short-term storage and for the reagents necessary for the current laboratory procedure.

All chemicals must be secured from falling in the event of an earthquake and potentially hazardous materials must have secondary containment that will contain their full volume in the event of a spill.

Incompatible chemicals must be segregated by having separate storage areas and adequate secondary containment.

Flammable/Combustible Chemicals

Always store flammables/combustibles in sealed containers and label them with the GHS symbol pictured above.

Store flammables in well-ventilated areas away from oxidizers, ordinary combustibles, and sources of heat or ignition (including such devices as magnetic stirrers).

Storerooms specifically used for flammables must have mechanical ventilation. Flammable liquids in quantities greater than one liter should be stored in approved flammable liquid storage cabinets clearly identified with signs or symbols.

Flammables used at the point of operation should not be dispensed from containers larger than one (1) gallon, unless from an approved safety can. If an approved safety can is used, it may be up to two (2) gallons in size.

Appropriate fire extinguishers for Class B (flammable or combustible liquid) fires should be available within 50 feet from where flammable liquids are stored or used.

Flammable/combustible materials storage and use areas should be clearly marked "FLAMMABLE MATERIALS STORAGE AREA" and "NO OPEN FLAME."

If refrigeration is necessary, only use spark-proof refrigeration equipment certified for the storage of flammable materials.

Oxidizers

Store oxidizers in well-ventilated areas and clearly label them with the GHS symbol shown above to signify that they can initiate or promote combustion in other materials. Examples of common oxidizers include many chromium and permanganate compounds, nitric and sulfuric acids, nitrates, chlorates and chlorites, oxygen, many halogens (iodine, chlorine, bromine, fluorine) and halogen compounds, hydrogen peroxide and other inorganic peroxides, and Tollen's reagent.

Store away from combustibles, organic matter, reducing agents, and sources of heat or ignition.
Keep oxygen cylinders free from oil, grease, dirt, or other contaminants.

Compressed gases/Aerosols

Compressed gas cylinders must always be stored away from external heat sources and located such that they will not be damaged by passing or falling objects. When possible, they will be stored upright with the cylinder secured.

Cylinders not in use should be stored with valve protection caps in place.

Oxygen cylinders in storage will be segregated from flammable gas cylinders (such as acetylene and hydrogen) by at least 20 feet or by a non-combustible wall at least 5 feet high.

Flammable gas cylinder storage areas will be clearly marked "FLAMMABLE GAS" and "NO OPEN FLAME."

All gas cylinders must be clearly marked with the chemical or trade name of the gas.

Empty cylinders should not be refilled except by the supplier.

All gas cylinders connecting hoses, couplings, and pressure regulators will be regularly inspected for defects.

Aerosols will not be stored in areas where the temperature may exceed 120 degrees Fahrenheit.

Corrosives

Personnel and students using or transporting corrosives must be aware of the potential for permanent eye and/or skin damage upon contact. Indirectly vented goggles with a full seal around the eyes and

appropriate gloves must be worn at all times (see Section 4). In instances with a high risk of splashing, face shields and rubber aprons should also be worn.

Corrosives should be stored in approved corrosive storage cabinets in well-ventilated areas. Corrosives cabinets should not have metal shelf clips due to the potential for degradation. Small quantities (one liter or less) of corrosives may be stored outside of cabinets approved for corrosives in polyethylene or ceramic trays to contain spills or leaks.

All corrosives must have nonmetal secondary containment.

Due to the potential for falls, spills, or splashes from storage at high levels, corrosives should be stored at or below waist level.

Areas where corrosives are stored or used in one gallon containers (or larger) should be equipped with plumbed-in eyewash stations and deluge showers or drench hoses.

Acids will be segregated from substances that they are reactive with (such as metals, metal oxides, hydroxides, amines, carbonates, and other alkaline materials).

Acids will be segregated from chemicals that generate toxic gases upon contact (such as chlorides, cyanates, cyanides, fluorides, hydrides, and sulfides).

Oxidizing acids, such as nitric acid and sulfuric acid, will be segregated from organic acids (such as acetic acid and formic acid) and flammables. Oxidizing acids must not be in direct contact with wooden cabinets or other cellulose materials, since they have the potential to spontaneously ignite them upon contact.

Nitric acid will be segregated from all other acids.

Health Hazards

Chemicals with a health hazard risk must be clearly labeled with the appropriate GHS pictograms for the hazards they present. Chemicals known to be irritants to the skin, eyes, or respiratory tract must be labeled with the exclamation point symbol shown above. Chemicals that are acutely toxic must be labeled with the skull and crossbones symbol. Those which present a chronic health hazard, such as carcinogenicity, mutagenicity, or reproductive toxicity must be labeled with the third symbol shown above.

Poison Control and other emergency numbers must be clearly posted in areas where acutely toxic materials are stored.

Toxics should only be stored in well-ventilated areas and should be used in a fume hood.

Highly toxic chemicals should only be used in the classroom after a careful review of the health hazards, routes of entry, safety precautions, and first aid. Use of these substances must be carefully monitored by the instructor.

Reactives

Reactives are chemicals that are inherently unstable and susceptible to rapid decomposition. These chemicals, under specific conditions, can react alone, or with other substances in a violent and uncontrolled manner, liberating heat, toxic gasses, or leading to an explosion. Air, light, heat, mechanical shock (when struck, vibrated or otherwise agitated), water, and certain catalysts can cause such reactions. Reactives should therefore be stored in cool, dry, well-ventilated areas and should not undergo mechanical shock.

Water reactive materials should be labeled "WATER REACTIVE" and should be stored away from all sources of water, including automatic overhead sprinklers.

Pyrophoric materials are those which may ignite spontaneously when exposed to the oxygen or moisture in air at or below 130 degrees Fahrenheit. Examples include sodium, potassium, lithium, and strontium. These materials must be segregated from halogenated hydrocarbons and oxidizers. Storage should only be in containers with the materials completely covered with a liquid (such as mineral oil) or inert gas appropriate for that chemical.

Peroxide Formers

All personnel and students using peroxide-forming chemicals must understand that they can be unstable, which makes them among the most hazardous substances handled in laboratories. It must be known that, if they have formed peroxides, they are low-power explosives that are sensitive to shock, sparks, heat, friction, strong oxidizing agents, and reducing agents. Common organic peroxide formers include aldehydes, ethers (e.g. ethyl ether), compounds containing benzylic hydrogen atoms (e.g. cumene), alkenes (e.g. cyclohexene), and vinyl and vinylidene compounds.

Quantities of peroxide formers should be limited to the minimum required.

Unused quantities should never be returned to the container.

All spills should be cleaned up immediately; solutions can be absorbed on vermiculite.

Peroxide formers should not be stored for prolonged periods of time. Frequently check the manufacturer's expiration date and the appropriate SDS to determine the maximum amount of time that a particular peroxide former should be stored.

Do not use glass containers that have screw-cap lids or glass stoppers for storage purposes, due to the risk of generating sparks upon opening. Avoid using magnetic stir bars as well.

Do NOT use metal utensils to handle peroxide formers. Ceramic or wooden utensils are acceptable.

Smoking, open flame, other heat sources, friction, grinding, and all forms of impact should be avoided.

Peroxide formers should be stored at the lowest possible, appropriate temperature.

Do not open a bottle that is past its expiration date or that has formed a precipitate. Place the intact bottle in a flammable storage cabinet for the next hazardous waste pick-up date.

Do not distill a peroxide-forming solvent to dryness.

Section 4 – Control Measures to Reduce Chemical Exposure

Engineering Controls

Engineering controls are physical barriers in place in the laboratory environment that are used to protect employees and students from hazards. Examples of engineering controls include general room ventilation, local ventilation such as fume hoods, and emergency equipment.

General Ventilation

Laboratories and stockrooms must contain ventilation that is not recirculated into the building, thus allowing vapors to be removed to the exterior of the building and for fresh outside air to be brought inside.

Fume Hoods – Fume hoods are of vital importance in any laboratory using hazardous chemicals. Each fume hood must be checked yearly to ensure that it is operating at a minimum average face velocity of 100 linear feet per minute (fpm). The average face velocity can be obtained by taking the average of six airflow readings along the plane of the sash through the use of a vaneometer or similar airflow measuring device. Airflow below an average of 100 fpm must be reported to Facilities and use of the hood must be discontinued until it is repaired. Each fume hood should have a visual indicator of airflow permanently affixed to it to allow convenient confirmation of adequate performance before use. In addition, fume hoods should be inspected annually by a qualified professional to certify that they are providing adequate airflow. When the required air velocity is obtained by partly closing the sash, the sash shall be marked to show the maximum opening at which the hood face velocity will meet the ventilation requirements.

Storage of items in fume hoods should be discouraged and work within the fume hood should take place at least six inches beyond the face of the hood. Hood ventilation shall remain in operation during all times hoods are in use, and for sufficient time thereafter, to ensure that all airborne contaminants have been removed. When mechanical ventilation is not in operation, hazardous substances in the hood must be covered.

Biology Safety Cabinets - Also called a biological safety cabinet or microbiological safety cabinet—is an enclosed, ventilated laboratory workspace for safely working with materials contaminated with (or potentially contaminated with) pathogens requiring a defined biosafety level. Calibration for this unit should be performed in conjunction with Facilities & Operations Department as it differs from fume hood calibration.

Cadaver Room General Precautions: Chemical and biological contaminants can be ingested due to poor work practices; lack of, or improper use of personal protective equipment; and inadequate sanitation protocol. To avoid ingesting contaminants:

- Do not eat or drink where preservative solutions are handled, processed, or stored.
- Use goggles and/or face shields when chemical splash to the face is possible or when gross dissection presents the potential for tissue particles to splatter or become airborne (e.g., use of electric bone saw).
- Wear goggles and impermeable gloves (nitrile) whenever working in areas where preservative fluids are stored or handled.
- Use fume hood when creating preservative solutions.

Contaminated personal protective equipment (PPE) must be removed upon exiting areas where chemicals, biological samples or cadavers are stored or processed such as the prep room, cold room, or classroom. Laboratory coats, aprons, coveralls (e.g., Tyvek), gowns, scrubs or disposable gowns/over clothing worn for protection in these areas should not be worn outside of the laboratory.

- Remove gloves and wash hands before leaving areas where work with preservative fluid is performed.
- Wash hands before eating, drinking, taking medications, smoking, and prior to using the computer, phone, or other frequently touched surfaces outside the area in question.
- Post shift showering is recommended after extensive handling of cadavers.

Emergency Equipment

Telephones – Telephones for emergency use only must be readily available to laboratory personnel. At a minimum, a phone must be located in a hallway adjacent to all laboratories and stockrooms. Emergency phone numbers should be clearly identified.

Eyewashes/Drench hoses – Eyewash/drench hoses must be accessible and unobstructed within ten seconds (roughly fifty feet or less) from all work areas where highly hazardous chemicals are being handled. Eyewashes must be able to deliver a 15-minute continuous supply of water and should have a stay-open valve that will allow the user's hands to remain free to remove clothing or to hold the eyelids open.

Fire Alarms – At a minimum, manual fire alarms should be located at each exit to the building.

Fire Extinguishers – Laboratories and stockrooms should have dry chemical fire extinguishers for fires of types A (wood/paper), B (flammable liquids), and C (electrical). Fire extinguishers for Class B fires should be available within 50 feet from where flammable liquids are stored or used. In addition, it is helpful to have carbon dioxide fire extinguishers, which can fight fires of types B and C with less residue left over. Sand or cat litter should also be on hand to help smother fires caused by combustible metals. Fire extinguishers must be clearly identified and near exits to ensure safe egress. Each fire extinguisher must be recharged as needed and certified at least annually. Dry chemical fire extinguishers have a needle/dial window which indicates whether the extinguisher is properly charged. The red zones

indicate that it is overcharged or undercharged and the green zone indicates proper pressure. Carbon dioxide extinguishers should feel heavy. If they are light, they likely need to be recharged.

Spill Kits – Each stockroom and all chemistry labs should have a spill kit on site. They should contain absorbent material, such as vermiculite or spill pads, in sufficient supply to absorb the largest containers of chemicals on hand. In addition, spill socks and pillows can be useful to place at the perimeter of a spill. Goggles and gloves suitable for a wide range of chemicals (such as Silver Shield) are a necessity, as well as several large polyethylene bags and an inert plastic scoop. Neutralization materials for acids and bases should also be included, such as sodium bicarbonate for acids and sodium bisulfate or citric acid for bases. Tongs are also very useful for picking up pieces of broken glass.

First Aid Kits – At a minimum, first aid kits should contain fresh band-aids, sterile gauze pads and medical tape.

Personal Protective Equipment - Personal protective equipment is protective wear that can help prevent injury to employees and students. Examples include eye protection, face shields, gloves, and protective clothing such as laboratory coats and aprons. Always consult the SDS for the chemical being used to obtain information regarding what personal protective equipment is recommended.

Eyewear – Eye protection must be worn by all personnel, students, and visitors in all locations where hazardous laboratory chemicals are used or stored. Safety glasses with side shields which comply with the American National Safety Institute (ANSI) standard Z87.1 provide minimal protection, but chemical indirectly vented goggles are necessary when working with potential projectiles and/or when there is a risk of chemical splashing. Ordinary prescription glasses lack side shields and do not form a seal around the face and thus lack adequate protection from splashes and flying particles. Therefore, chemical splash goggles must be worn over prescription glasses when working with hazardous laboratory chemicals. All shared eyewear should be sterilized between uses.

Face Shields – Full-face shields should be worn in addition to safety glasses or goggles when conducting highly hazardous laboratory operations, such as when handling potentially explosive compounds or when working with highly corrosive chemicals, such as concentrated acids or bases. Face shields should also be worn when there is a risk of projectiles. Face shields are not meant to be worn alone and should never be worn without safety glasses or goggles beneath them.

Gloves - Gloves should always be worn when handling hazardous chemicals, sharp-edged objects, very hot or very cold materials, and substances of unknown toxicity. No single glove material provides effective protection for all uses. See **Appendix C** for a general guide to selecting gloves for chemical use. For more specific information, it is best to consult the SDS for the chemical being used and to consult glove manufacturers to obtain information regarding the permeation ratings and degradation times for various gloves when used with specific chemicals. For another helpful resource regarding which glove materials best protect against specific chemicals, see OSHA Personal Protective Equipment.

Always inspect gloves for holes and tears before use. Do not attempt to clean and reuse disposable gloves. Remove gloves before leaving the laboratory or before touching items that might be handled by those not using gloves. Always wash your hands after removing gloves.

Protective Clothing – Wearing appropriate clothing to offer maximum coverage, including long pants and sleeves, shoes that cover the entire foot, and socks that cover the ankles are essential practices in maintaining a safe laboratory environment. Employees and students must not work in a laboratory setting without this minimal level of protective clothing. Additional protective apparel, such as lab coats and aprons, should be selected as needed to suit the material being handled. Cotton lab coats offer minimal protection and should not be relied on for protection from acids and other corrosive materials. Plastic or rubber lab aprons are helpful for use with corrosives, but are not appropriate wear when working with flammables due to lack of resistance to burning and to the potential for static electricity accumulation.

Section 5 – Housekeeping, Maintenance, and Inspections

Proper housekeeping, diligent maintenance of equipment, and regular inspections are of paramount importance in providing a safe laboratory environment.

Housekeeping

1. Never obstruct access to exits and emergency equipment.
2. Do not store items on bench tops, floors, or in aisles.
3. Keep work areas clean and free of clutter.
4. Return all equipment and laboratory chemicals to their designated storage locations at the end of the day.
5. Clean up spills and broken glassware immediately.
6. Dispose of all waste properly by the end of the day (see Section 11).
7. Chemical inventories should be updated annually and items which show signs of deterioration (clumping, wetness in solids, discoloration, crystal formation in liquids, etc.), have passed the manufacturer's expiration date, or are not being used should be disposed of promptly according to the guidelines outlined in Section 11.

Maintenance

1. Laboratory equipment should be regularly inspected, maintained, and serviced.
2. Any equipment that is malfunctioning or appears damaged should be removed from use until it has been repaired.

Inspections

1. Laboratory technicians should conduct a monthly, unless otherwise modified, inspection of the hazardous waste accumulation areas to ensure that there is adequate secondary containment, that bottles are closed and intact with no leakage, that labels are clear and undamaged, and that incompatible chemicals are adequately separated. **See Appendix D** for a sample inspection form.

2. Laboratory technicians should conduct a monthly inspection of both laboratory and safety equipment, safety showers or drench hoses, fire extinguishers, spill kits, and first aid kits to ascertain that all are fully stocked and functioning adequately. See **Appendix D** for a sample monthly inspection checklist.
3. Laboratory technicians should conduct a weekly inspection of eyewash stations.
4. Chemical fume hoods must be inspected and certified annually by a qualified professional to ensure that they are functioning at a minimum average airflow of 100 linear feet per minute.
5. The Chemical Hygiene Officer should conduct an annual comprehensive safety inspection of the SBCC laboratories. See **Appendix F** for a sample annual inspection checklist.

Section 6 – Medical Program

SBCC shall provide all employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations which the examining physician determines to be necessary, under the following circumstances:

1. Whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory, the employee shall be provided an opportunity to receive an appropriate medical examination.
2. When employees are routinely exposed to chemicals above the action level (or in the absence of an action level, the Permissible Exposure Level) for an OSHA regulated substance for which there are exposure monitoring and medical surveillance requirements, medical surveillance shall be established for the affected employee as prescribed by the particular standard.
3. Whenever an event takes place in the work area such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee shall be provided an opportunity for a medical consultation. Such consultation shall be for the purpose of determining the need for a medical examination.

All medical examinations and consultations shall be performed by or under the direct supervision of a licensed physician and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place.

The employer shall provide the following information to the physician:

1. The identity of the hazardous chemical(s) to which the employee may have been exposed.
2. A description of the conditions under which the exposure occurred, including quantitative exposure data, if available.
3. A description of the signs and symptoms of exposure that the employee is experiencing, if any.

For examinations or consultations provided by a physician, the employer shall obtain a written opinion from the examining physician which shall include the following:

1. Any recommendation for further medical follow-up.
2. The results of the medical examination and any associated tests.
3. Any medical condition which may be revealed in the course of the examination which may place the employee at increased risk as a result of exposure to a hazardous workplace.
4. 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 from the physician shall not reveal specific findings of diagnoses unrelated to occupational exposure.

The above outlined policy also applies to students exposed to hazardous chemicals through a spill, accident, or explosion in a classroom laboratory.

Section 7 – Records

Recordkeeping will include the following:

1. Records of changes to the Chemical Hygiene Plan.
2. Records of health and safety training for employees working in campus laboratories.
3. Records of emergency equipment and chemical storage area inspections.
4. Records of annual comprehensive laboratory inspections.
5. Records of the annual fume hood and biological safety cabinet inspections.
6. Records of incident reports and supervisor's report of employee injury or illness.
7. Medical examination and surveillance reports of employees and students.

All annual inspection records and chemical hygiene training records will be maintained for at least five years by the Risk Manager and by the District. Incident reports, supervisor's report of employee injury or illness, and additional safety training records will also be maintained by the District for a minimum of five years. Medical records will be kept for the duration of an employee's employment at SBCC plus an additional thirty years and will be maintained by the District.

Section 8 – Signs and Labels

Container Labeling - All purchased chemicals must contain the original manufacturer's label, which must include the manufacturer's name and address, the full chemical name and concentration, and the appropriate GHS pictograms and hazard warnings.

When a chemical is transferred to a new container, the new container must be labeled with the full chemical name, concentration, and appropriate GHS pictograms.

Hazardous waste containers must be clearly labeled "HAZARDOUS WASTE", stored face forward, and must identify the type of waste, the physical state (solid or liquid), the appropriate hazard warnings, the name and address of SBCC, and the date accumulation began.

Emergency Information – Contact numbers in the event of an emergency and the SBCC Emergency Action Guide must be readily accessible and clearly visible by the door of each stockroom and laboratory.

Emergency Equipment – The following equipment must be clearly labeled and highly visible:

1. Eyewash stations
2. Deluge showers or drench hoses
3. Fire extinguishers
4. First aid equipment
5. Spill kits
6. Exits

Areas or Equipment Which Pose Special Hazards – Warnings must be posted for the following:

1. Flammable materials storage areas
2. Oxidizer storage areas
3. Bulk corrosives storage areas
4. Biohazards
5. Hazardous waste storage areas

Miscellaneous Signs – Have signs posting the following:

1. Areas where food and beverage storage and consumption are not permitted
2. "No open flame" areas

Section 9 – Spills and Accidents

All spills and accidents involving exposure to hazardous chemicals must be documented by those at the scene of the incident using the following forms:

- Chemical Hygiene Plan Incident Report (witnesses to spills/accident)
- Chemical Hygiene Plan Accident Investigation Form

Additionally if an employee was injured during the spill the supervisor must complete the following form:

- Supervisor's report of employee injury or illness form

The CHO must complete the following form:

- Chemical Hygiene Plan Accident Investigation Form

A copy of these forms should be given to the Risk Manager and to the Chemical Hygiene Officer once they are completed. All of the forms listed above are also accessible on the SBCC Risk Management website.

Leaks/Spills - Assess the situation first. Determine which of the following pathways to take:

1. If the chemical spilled is nonhazardous, clean up promptly and resume normal activities.

2. If the spill is hazardous, but not a high hazard (defined in Section 2), and is less than a liter in quantity, don appropriate personal protective apparel and clean up with a spill kit, provided that you are adequately trained to do so. Promptly contain the spill by throwing absorbent material (such as vermiculite or spill pads) on the spill as quickly as possible. Concentrate the absorbent material around the perimeter of the spill in order to keep it from spreading and use spill socks located in the emergency spill kits to contain larger spills.

   If the material spilled is an acid, neutralize with sodium bicarbonate. If the chemical is a base, neutralize with sodium bisulfate or citric acid. Further information and instructions on clean-up can be obtained for specific chemicals by reading the SDS for that chemical. When the spill has been absorbed, carefully sweep up the debris and place it in one of the heavy duty bags provided in the spill kit. Use tongs if there is broken glass. Label the waste "Hazardous Waste" and describe the contents to the best of your ability.

   3. If the spill is a high hazard chemical and/or if the quantity is greater than a liter, evacuate others from the area and determine if you have the appropriate training and personal protective equipment to clean it up. Also, if the chemical has spilled outside a fume hood and is highly volatile and toxic, you should not respond if you have not been fitted and trained in the use of a respirator within the past year. If you are not equipped to handle the spill, either call on the CHO in your area or call the Fire Department for assistance in cleaning up. If the leak/spill cannot be adequately and safely contained until help can arrive, if it poses an immediate fire risk, or if it has entered a drain or ventilation system other than the fume hoods, call 911 for help from the fire department and pull the fire alarm to evacuate the building. If possible, provide an SDS for the chemical(s) involved in the spill for emergency personnel. Turn off all sources of power and ignition in the area, if it is safe to do so.

   If you determine that you can clean up the spill, alert others to what you are doing before starting. If possible, have a partner to help with the clean-up. Use a spill kit as described in the previous scenario. Putting on two pairs of gloves is recommended in order to provide extra dermal protection.

Spill Response - In the event of a chemical spill, the first step is to assess and isolate the release. In other words, know what the spill is comprised of: is it liquid/solid/gas? What is the immediate hazard? Immediately isolate the area and notify Campus Safety and F&O. Determine if the spill is a Simple or Complex spill.

Simple Spill guidelines:

- (1) Liter or less is released
- The chemical release is of low to moderate hazard level

- The specified Spill Response Kit, materials and PPE are readily available
- The lab staff have received training to clean up the spill

Complex Spill guideline:

- Of a greater quantity than the amount of absorbent in the laboratory
- Volatile (flammable or toxic vapors)
- Corrosive
- An ignition source
- Air or water reactive

Under most circumstances, lab personnel should be able to clean up a simple spill in the lab. Complex spills must be handled in coordination with F&O and local resources.

Eye Contact – *The single most important step in preventing permanent eye injury is to immediately flush eyes with copious amounts of water for at least fifteen minutes.* While rinsing is underway, have someone else call 911 if chemical contact involves a strong acid or base or another highly corrosive or highly toxic chemical. Eyelids should be held open with the thumb and forefinger while rinsing. Engage the eyewash locking mechanism to keep the water flow locked in the "on" position. Rolling the eyes during rinsing will also help expose as much of the eyes to water as possible. Have another person keep track of time to ensure adequate rinsing. If rinsing is delayed or cut short, first aid treatment is much less effective.

Following thorough rinsing, have students go to the SBCC Student Health Services for an evaluation unless 911 is responding**.** Employees should be examined by a physician off campus. In either situation, bring an SDS of the chemical involved to aid the health care provider in treatment.

Skin Contact – As noted above, promptly flush the affected area with water for fifteen minutes, removing contaminated clothing. Following thorough rinsing, students should be evaluated at SBCC Student Health Services and employees should be examined by a physician off campus. Bring a copy of the SDS for the chemicals involved.

Ingestion – Call **Poison Control at 1-800-222-1222** with the appropriate SDS on hand. Call 911 if recommended by Poison Control. Only induce vomiting if recommended by a physician. Save all containers and a small sample of vomitus, if possible, for analysis.

Inhalation – Promptly remove affected individuals from the area and expose them to fresh air. If symptoms persist, seek medical attention.

Fires, Natural Disasters, and Other Emergency Situations – Follow the protocols outlined in the Santa Barbara City College Emergency Action Guide, posted by a door in all classrooms, laboratories, and stockrooms.

Section 10- Training Program

Laboratory Personnel:

Fire Extinguisher Training - All laboratory personnel should receive training in the location and proper use of fire extinguishers.

Chemical Hygiene Plan Training - Upon implementation of the Chemical Hygiene Plan (CHP), all laboratory personnel must receive training that covers the location and content of both the Laboratory Standard, "Occupational Exposure to Hazardous Chemicals in Laboratories" and the CHP. Upon initial employment, all new laboratory personnel must also receive this training. In addition, employees will receive appropriate training prior to assignments involving new exposure situations.

CHP training must include emergency and personal protection training, the physical and health hazards of chemicals in the work area (including knowledgeable use of SDS information), and how to detect and respond to exposure to chemical hazards. Training should be updated as needed when the CHP is modified.

Additional Training required of laboratory personnel includes Hazardous Waste Handler training. Further training specific to the laboratory may be required, such as Bloodborne Pathogen training and Respiratory Protection training. These trainings are beyond the scope of the Chemical Hygiene Plan. Please refer to the Bloodborne Pathogens Plan for instances involving bodily fluids.

Students:

All students participating in laboratory courses must receive safety training during the first class meeting of each semester. In addition, student aides and work-study students should receive this safety training before commencement of their employment. Training should include the proper handling of chemicals, the proper use of personal protective equipment and fume hoods to reduce chemical exposure, safe disposal of chemicals, the location and use of safety equipment, and how to respond in the event of an emergency.

See **Appendix G** for a sample Chemistry Safety Contract given to all students at the beginning of each semester. Students will be required to read and sign the laboratory conduct information and agree to abide by the rules described therein. This appendix also contains a sample laboratory drawer sign-out sheet, which requires students to sign an agreement that they are responsible for their lab drawer equipment.

It is advised that instructors include safety information questions on tests to help students maintain safety as a top priority. In addition, assignments that require students to report on SDS information can be helpful in assessing whether students understand the safety material available to them.

Section 11- Waste Disposal Program

The aim of the waste disposal program is to assure that minimal harm to people, other organisms, and the environment will result from the disposal of waste laboratory chemicals.

Chemicals which cannot be discharged into the sewer system: Concentrated acids or bases, highly toxic, malodorous, or lachrymatory substances, or any other substances which might interfere with the biological activity of wastewater treatment plants, create fire or explosion hazards, cause structural damage, or obstruct flow.

Hazardous Waste Storage and Labeling:

For the purpose of this document, hazardous waste shall be defined as waste which presents hazards such as flammability, corrosivity, toxicity, and reactivity. Hazardous waste must not be disposed of down drains or sent to the landfill, but instead should be collected in well-labeled containers with tight seals and a recommendation of at least 50% capacity secondary containment.

Hazardous waste containers shall be labeled with the following information:

1. The words “HAZARDOUS WASTE”
2. The type of waste (such as halogenated or non-halogenated organic waste, metals waste, etc.)
3. The physical state (such as solid, liquid or gas)
4. Hazard warnings (such as flammable, corrosive, toxic, etc.)
5. The campus name and address
6. The start date of accumulation
7. The pH of liquid mixtures
8. Waste containers must be stored with the labels face forward

All hazardous waste must be labeled from the time waste is first added until the time the waste is picked up for proper disposal. Hazardous waste should be stored in an area designated and labeled as hazardous waste storage, with adequate ventilation and protection from sources of ignition. Lab technicians should inspect the hazardous waste accumulation area weekly to ensure that the waste is being stored safely.

If a chemical is an unknown byproduct of a reaction, it shall be assumed to be hazardous waste.

Hazardous waste must not be stored for more than 180 days from the start of accumulation and must be disposed of by a licensed waste disposal specialist. SBCC’s disposal specialist is **Carlos Campos with C&K Services at (805) 331-9048.** A hazardous waste log of accumulated waste should be maintained by the appropriate laboratory technician and presented at the time of waste pick-up.

Section 12 - Lab Classroom Capacities

The District bases Science lab classroom capacities on Division of State Architect (DSA), California Building Code, and the Office of the State Fire Marshal. California Building Code interpretation of net

square footage does include fixed furniture such as cabinets. While other organizations such as the National Fire Protection Association (NFPA) and American Chemical Society (ACS) do not include fixed furniture in the net square footage.

Per DSA IR A26cc, the occupant load factor for lab classrooms is 50 square feet per person. Per California Building Code 1004.6, for areas having fixed seats and aisles, the occupant load shall be determined by the number of seats installed therein.

In the Spring of 2022, a room capacity audit was completed by an architect, in conjunction with the Chemistry Department, and it was confirmed the lab classrooms PS 208, PS 209, PS 214, PS 219 student capacities are set at the number of stations in the room (24, 24, 24, and 16 students respectively), as approved by Division of State Architects, irrespective of the square footage of those rooms.

In the Summer of 2022, a room capacity audit was completed by the architectural firm LPA, in conjunction with the EBS Departments, and those laboratory capacities are as follows.

Room	Capacity
EBS-115	24
EBS-123	24
EBS-201	30
EBS-202	32
EBS-210	33
EBS-209	33
EBS-312	30
EBS-313	36
EBS-311	15

Appendix A - The Globally Harmonized System of Classification and Labeling (GHS)

https://www.osha.gov/dsg/hazcom/global.html

www.unece.org/trans/danger/publi/ghs/ghs_rev02/02files_e.html

Appendix B – NFPA Hazard Ratings

The National Fire Protection Association (NFPA 704) system uses a diamond-shaped diagram of symbols and numbers to indicate the degree of hazard associated with a particular chemical or material. These diamond- shaped symbols are placed on containers of chemicals or materials to help the user assess the potential hazard that may be associated with that item.

The diagram identifies three color-coded categories of hazard for each material:

- health hazard (blue section),
- flammability (red section),
- reactivity (yellow section), and
- other hazard information (white section)

Each category is divided into five levels of hazard potential with:

- **zero (0)** used to indicate no special hazards and
- **four (4)** for severe or extreme hazard potential

The degrees of hazard in each of these categories are given as follows:

Health - The degree of health hazard of a chemical or material is based on the form or condition of the material, as well as its inherent properties. The degree of health hazard of a material should indicate the degree of personal protective equipment required for working safely with the material:

a. **A rating of 1** is for **slightly hazardous (toxic) materials** which require only minimal protection (for example, safety glasses and gloves) in addition to normal work clothing to work with safely.
b. **A rating of 2** is for **moderately toxic or hazardous materials** which require additional PPE or equipment (e.g. chemical goggles, lab/work smock, local ventilation) in addition to that required for less toxic material. Consult the SDS for specific health hazards and proper PPE to use with this material.
c. **A rating of 3 or 4** is for **highly to extremely toxic (deadly) material (and any carcinogen, mutagen, or teratogen)**. These materials will require specialized equipment (e.g. a fume hood, full face shield, rubber apron, specialized gloves, handling tongs, etc.) beyond that required for moderately toxic materials. You must consult the SDS and/or other safety information to

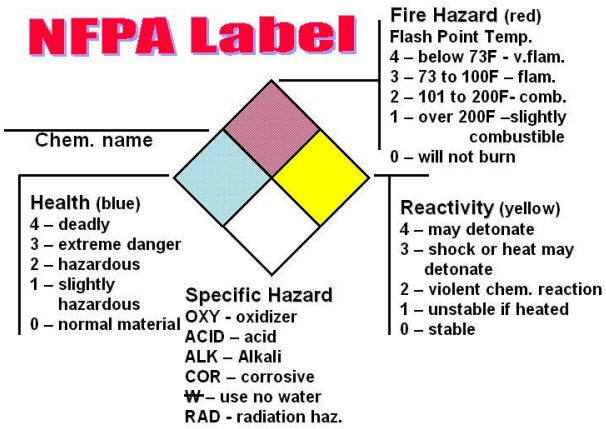
determine the hazard (acute or chronic) and the proper PPE and engineering controls to safely use this material.

Flammability - The flammability hazards deal with the degree of susceptibility of the material to ignite and burn. The form or condition of the materials, as well as their properties, affects the extent of the hazard. Many hazardous materials, such as acetone and gasoline, have a flash point (ignition temperature) far below freezing and will readily ignite with a spark if the vapor concentration is sufficient. A low rating of **1** is for material with a flash point **above 200 degrees Fahrenheit,** while more hazardous ratings of **2, 3, and 4** are for materials with **respective flash points below 200, 100 and 73 degrees Fahrenheit.**

Reactivity - The reactivity hazards deal with the potential of a material or chemical to release energy. Some materials are capable of rapid release of energy without any catalyst, while others can undergo violent eruption or explosive reactions if they come in contact with water or other materials. Generally this rating is used to indicate the potential reactivity if the material is heated, jarred, or shocked. A low rating of **1** indicates a **material that is normally stable but may be reactive if heated**. The more hazardous ratings of **2, 3**, and **4** indicate increasing **susceptibility to reactivity due to shock, friction, etc. which may result in a violent reaction or detonation.**

Other Hazard Information - An open space at the bottom of the NFPA diagram can be used to indicate additional information about the chemical or material. This information may include the chemical or material's radioactivity, proper fire extinguishing agent, skin hazard, its use in pressurized containers, protective equipment required, or unusual reactivity with water. For example, the usual signal to indicate unusual reactivity with water is the letter "**W**" with a long line through the center. Similarly the words **ACID, COR** (corrosive), **RAD** (radioactive), **OXY** (oxidizer), **CARC** (carcinogen) or other abbreviations may be used.

The following shows a summary of the NFPA rating system used for labeling containers of chemicals.



Note: The NFPA rating system was designed primarily for firefighters to assess the risk involved in short-term exposure. Therefore, the health ratings are aimed at acute effects rather than chronic hazards. As a result, our chemical hygiene plan is now adopting the GHS system of hazard

classification, which has a much more in-depth approach to identifying health hazards. These health hazard categories are determined from an accumulation of many scientific studies from around the world and provide much more specific information about the health concerns involved. However, since new safety data sheets (SDS) containing GHS information are not yet available for all chemicals, the NFPA rating system can be useful in the interim.

Appendix C– Guidelines for Selecting Suitable Gloves

Selecting the proper chemical protection glove is a process that requires examining the chemicals used and the processes and exposure times. Not all "rubber" type chemical protection gloves are the same. One cannot determine the applicability of a specific chemical protective glove without knowing the exact material and the materials' resistance to decomposition for specific chemicals. Glove manufacturers should be consulted to obtain this information for their products.

S - Superior
E - Excellent
G - Good
F - Fair
NR - Not Recommended
*Not recommended for Acetaldehyde, use Butyl Rubber

CHEMICAL FAMILY	BUTYL RUBBER	NEOPRENE	PVC (VINYL)	NITRILE	NATURAL LATEX
Acetates	G	NR	NR	NR	NR
Acids, inorganic	G	E	E	E	E
Acids, organic	E	E	E	E	E
Acetonitrile, Acrylonitrile	G	E	G	S	E
Alcohols	E	E	NR	E	E
Aldehydes*	E	G	NR	S*	NR
Amines	S	NR	NR	F	NR
Bases, inorganic	E	E	E	E	E
Ethers	G	F	NR	E	NR
Halogens (liquids)	G	NR	F	E	NR
Inks	G	E	E	S	F
Ketones	E	G	NR	NR	G
Nitro compounds (Nitrobenzene, Nitromethane)	G	NR	NR	NR	NR
Oleic Acid	E	E	F	E	NR
Phenols	E	E	NR	NR	G
Quinones	NR	E	G	E	E

Solvents, Aliphatic	NR	NR	F	G	NR
Solvents, Aromatic	NR	NR	F	F	NR

Appendix D-Sample Monthly Safety Inspection Checklist

Appendix E – Sample Annual Safety Inspection Checklist

(To be completed by the SBCC Chemical Hygiene Officer)

Inspection performed by: _____ **Date:** _____

Department: _____ **Building and Room #:** _____

General Safety:	**Yes**	**No**	**N/A**
1. Emergency phone numbers and procedures are posted.	___	___	____
2. SDS materials are visible and easily accessible.	___	___	____
3. The Chemical Hygiene Plan is up-to-date and readily accessible.	___	___	____
4. Good housekeeping prevails and aisles are uncluttered.	___	___	____
5. All exits are clear and unobstructed.	___	___	____
6. Signs noting the location of the safety equipment are visible.	___	___	____
7. Sharp objects, such as needles and broken glass, are contained in labeled, puncture-proof containers.	___	___	____
8. Electrical cords are free from damage and are grounded with 3-prong plugs.	___	___	____
9. Based on a discussion with the appropriate lab manager, all electrical appliances and lab equipment are in good repair or have been removed from service.	___	___	____
10. Monthly general safety inspections have been completed by the appropriate lab manager.	___	___	____

Comments: _____

_____

Safety Equipment:

1. Safety glasses/goggles are available and in good condition.	___	___	____
2. Chemical protective gloves are available.	___	___	____

3. The drench hose/eyewash is unobstructed and flows freely. ___ ___ ____
4. The eyewash nozzle shields are in place and in good condition. ___ ___ ____
5. The eyewash can be adjusted for automatic continuous flow. ___ ___ ____
6. The fume hoods have passed an annual inspection by a qualified professional. ___ ___ ____
7. Chemical spill kits are adequately supplied with gloves, absorbent material, neutralizing chemicals, sturdy bags, a plastic scoop and dust bin, and a large bucket. ___ ___ ____
8. Fire extinguishers are unobstructed, have the safety pin intact, and are fully charged (in the green zone on the indicator window). ___ ___ ____
9. First aid kits contain fresh bandages, gauze pads, and medical tape. ___ ___ ____
10. Monthly safety equipment inspections have been completed by the appropriate lab manager. ___ ___ ____

Comments: _____

_____

Chemical Storage and Labeling:

1. Chemical containers are properly labeled and intact. ___ ___ ___
2. Incompatible chemicals are separated from each other. ___ ___ ___
3. Open shelves are equipped with lips or barriers to protect contents. ___ ___ ___
4. Cabinets are secured from opening in the event of an earthquake. ___ ___ ___
5. Potentially hazardous chemicals have secondary containment. ___ ___ ___
6. Gas cylinders are labeled, upright, properly secured, and free from damage and grounded if necessary. ___ ___ ___
7. Peroxide-forming reagents are dated when received and when opened and are not stored beyond the recommended storage time. ___ ___ ___
8. Flammable chemicals in quantities greater than one liter are stored in clearly labeled flammable storage cabinets. ___ ___ ___
9. Flammables are labeled with the appropriate GHS pictogram and are kept away from oxidizers and sources of heat or ignition, and are not stored in a refrigerator unless the refrigerator is certified for flammable storage. ___ ___ ___
10. Corrosive chemicals in quantities greater than one liter are stored in labeled corrosives cabinets and are stored at or below waist level. ___ ___ ___
11. Containers containing corrosives are labeled with the appropriate GHS

pictogram. ___ ___ ___

12. Acids and bases are separated from each other and nitric acid is separated from other acids. ___ ___ ___
13. Chemicals that present a health hazard are labeled with the GHS pictogram for these hazards. ___ ___ ___
14. Chemicals that can initiate or promote combustion in other materials are labeled with the GHS oxidizer pictogram and are stored away from organic materials, reducing agents, and sources of heat or ignition. ___ ___ ___
15. Chemicals that react with water are labeled "WATER REACTIVE" and are protected from sources of water, including overhead sprinklers. ___ ___ ___
16. Monthly inspections of chemical storage areas have been completed. ___ ___ ___
17. A current inventory of all chemicals located in this department is readily available. ___ ___ ___

Comments: _____

_____

Hazardous Waste:

1. Hazardous waste containers are labeled "HAZARDOUS WASTE" and identify the type of waste, physical state of the waste (solid or liquid), appropriate hazard warnings, the name and address of SBCC, and the date accumulation began. ___ ___ ___
2. Hazardous waste containers are capped and fully intact, have secondary containment, and show no sign of leakage. ___ ___ ___
3. Hazardous waste is stored in a well-ventilated area that is protected from sources of ignition and has not been stored for greater than 180 days. ___ ___ ___
4. All waste containers are stored with labels face forward.

Weekly hazardous waste inspection logs have been completed. ___ ___ ___

Comments: _____

_____

Training:

1. Students taking laboratory classes in this department have received basic laboratory safety training.	___	___	___
2. Student workers in this department have received basic laboratory safety training.	___	___	___
3. Employees in this department have received CHP training.	___	___	___

Comments: _____

_____

Recordkeeping:

1. Annual fume hood inspection records are readily accessible.	___	___	___
2. Incident Reports and Supervisor's Accident Investigation forms are readily accessible.	___	___	___

Comments: _____

_____

Appendix F – Chemical Hygiene Plan Incident Report and Accident Investigation Form

Santa Barbara City College

APPENDIX G - Student Chemical Safety Contract

Appendix H– Cal OSHA Laboratory Standard Text (CCR Title 8, Section 5191) and Appendix A from the OSHA Laboratory Standard

Subchapter 7. General Industry Safety Orders
Group 16. Control of Hazardous Substances
Article 109. Hazardous Substances and Processes

§5191. Occupational Exposure to Hazardous Chemicals in Laboratories.