HAZARDOUS CHEMICAL SAFETY POLICY CUM MANUAL

by
Department of Chemistry
Govt. Holkar (Model, Autonomous) Science College, Indore

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FORENOTE

It is my pleasure to provide a foreword for this Hazardous Chemical Safety Policy cum Manual. The manual provides important guidance on the safe handling of hazardous chemicals, which is critical to protecting the health and safety of workers, the public, and the environment.

The use of hazardous chemicals is a necessary part of many industries, but it also poses significant risks. Mishandling or improper disposal of these chemicals can lead to serious health problems, environmental damage, and even loss of life. Therefore, it is crucial that we have strict safety policies and procedures in place to mitigate these risks.

This manual outlines the necessary protocols and best practices for the safe use, storage, transportation, and disposal of hazardous chemicals. It covers topics such as risk assessment, labeling, personal protective equipment, emergency response, and more. By following these guidelines, organizations and individuals can minimize the risks associated with the handling of hazardous chemicals.

It is my hope that this manual will serve as a valuable resource for anyone involved in the handling of hazardous chemicals. I commend the authors and contributors for their hard work in producing this important document, and I encourage all the students, research scholars, faculties, lab technicians and lab attendants to take its guidance seriously.

I congratulate Department of Chemistry for coming up with this immensely important document.

Dr. Suresh T Silawat
Principal
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FORENOTE

It is with great pleasure that we present to you this Hazardous Chemical Safety Policy cum Manual. The purpose of this manual is to provide guidance and direction to students, research scholars, faculties and laboratory assistants involved in the handling, storage, transportation, and disposal of hazardous chemicals.

The manual outlines the necessary procedures, protocols, and best practices to ensure that the use of hazardous chemicals is carried out in a safe and responsible manner. It is intended to serve as a reference tool for anyone who is involved in handling hazardous chemicals.

The use of hazardous chemicals is necessary in many industries and is essential for the development of our society. However, their improper use and disposal can have severe consequences on human health and the environment. Therefore, it is of utmost importance that we adhere to strict safety policies and procedures to minimize any potential hazards. This policy cum manual will inculcate a safety culture, while working in chemical laboratories.

This Hazardous Chemical Safety Policy cum Manual is an important tool that will enable all learners to achieve their objectives while maintaining a safe and healthy workplace. I hope that you find it informative and useful.

Dr. Anamika Jain
HoD, Department of Chemistry

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A hazardous chemical safety policy is as set of guidelines, procedures, and regulations aimed at managing and mitigating the risks associated with hazardous chemicals in the workplace, community, and environment. The policy outlines the responsibilities of faculties, research-scholars, students and others in ensuring the safe handling, storage, transportation, and disposal of hazardous chemicals.

Introduction:

Chemical hazard safety policy is a set of rules, guidelines, and procedures put in place to protect individuals from harm caused by chemicals. Chemical hazards can occur in a variety of settings, such as workplaces, laboratories, and homes. The purpose of chemical hazard safety policy is to minimize the risk of chemical exposure and ensure that proper measures are taken to prevent accidents and injuries.

The policy outlines the responsibilities of employers, employees, and other individuals who may come into contact with hazardous chemicals. It includes procedures for handling, storing, and disposing of chemicals, as well as guidelines for emergency response in the event

of a chemical spill or other incident. The policy also provides information on personal protective equipment and training requirements.

Chemical hazard safety policies are typically developed based on regulations and standards set by organizations such as OSHA (Occupational Safety and Health Administration) and EPA (Environmental Protection Agency). These policies are critical to ensuring the health and safety of individuals working with or around hazardous chemicals. It is important to regularly review and update these policies to ensure that they are current and effective in protecting against chemical hazards.

As per the guidelines of UGC, awareness and adherence to the guidelines for the disposal of radioactive and other hazardous materials/ chemicals is mandatory for all. Though the institution does not use any type of radioactive materials, but it follows all the UGC directives regarding handling of hazardous chemicals and do's and do not's during an emergency in a chemical lab.

Components of Policy:

The policy typically includes the following components:

- **Hazard identification:** The policy should identify the hazardous chemicals used, stored, or transported in the workplace or community.
- **Risk assessment:** The policy should assess the risks associated with the use of hazardous chemicals and determine the appropriate control measures to mitigate those risks.
- **Control measures:** The policy should outline the control measures, such as engineering controls, administrative controls, and personal protective equipment, to minimize exposure to hazardous chemicals.
- **Training and education:** The policy should require training and education programs for employees and contractors who handle hazardous chemicals, to ensure that they understand the hazards and how to protect themselves.
- **Emergency response:** The policy should establish procedures for responding to emergencies involving hazardous chemicals, including spill containment, evacuation, and notification of emergency services.
- **Reporting and record-keeping:** The policy should require reporting of incidents involving hazardous chemicals and record-keeping of chemical inventories, exposure data, and training programs.
- **Compliance and enforcement:** The policy should establish procedures for ensuring compliance with regulations and guidelines related to hazardous chemicals and for enforcing penalties for non-compliance.

The hazardous chemical policy is crucial for protecting students, research scholars, and the environment from the hazards associated with hazardous chemicals. It should be regularly reviewed and updated to reflect changes in regulations, technology, and best practices.

Why and how to ensure Chemical safety Rules and Standard Operating Procedures: General guidelines

Chemical safety rules and standard operating procedures (SOPs) are essential for preventing accidents, injuries, and environmental damage that can result from the handling, use, storage, and disposal of hazardous chemicals.

By understanding the different categories of chemical hazards, potential chemical hazards can be identified in the workplace and take steps to prevent or mitigate them.

Here are some general guidelines for developing and implementing chemical safety rules and SOPs:

i. Identify the hazardous chemicals used in the workplace and assess the risks associated with their handling, use, storage, and disposal.
ii. Develop written chemical safety rules and SOPs that address the identified hazards and the steps needed to mitigate them.
iii. Provide training for all employees who handle, use, store, or dispose of hazardous chemicals on the chemical safety rules and SOPs.
iv. Ensure that employees understand the chemical safety rules and SOPs and follow them consistently.
v. Conduct regular safety inspections and audits to identify and correct any deviations from the chemical safety rules and SOPs.
vi. Develop emergency response plans for chemical spills, releases, fires, and other incidents that may occur.
vii. Ensure that all hazardous chemicals are properly labeled, stored, and secured to prevent unauthorized access and spills.
viii. Provide personal protective equipment (PPE) and ensure that employees know how to use and maintain it properly.
ix. Establish a system for reporting and investigating chemical spills, releases, injuries, and near-misses to identify the root causes and prevent future incidents.
x. Review and update the chemical safety rules and SOPs periodically to reflect changes in the workplace, new hazards, and regulatory requirements.

By following these guidelines, comprehensive chemical safety program can be established that promotes a safe and healthy workplace for everyone.

What are hazardous chemicals?

Hazardous chemicals are substances or mixtures that have the potential to cause harm to humans, animals, or the environment due to their physical, chemical, or toxicological properties. These chemicals may be flammable, explosive, corrosive, reactive, carcinogenic,

mutagenic, or toxic to different degrees, and may pose various hazards such as fire, explosion, chemical burns, respiratory problems, and environmental pollution.

Examples of hazardous chemicals include pesticides, solvents, acids, heavy metals, radioactive materials, and many others. It is essential to handle, use, store, and dispose of hazardous chemicals properly to minimize the risks to human health and the environment.

General Categories of Hazardous Chemicals and Standard Operating Procedures for their handling:

Chemical hazards are substances or mixtures that have the potential to cause harm to humans, animals, or the environment due to their physical, chemical, or toxicological properties. Here are some common categories of chemical hazards:

A. Toxic chemicals:

These are chemicals that can cause harm to humans or animals when exposed to them in sufficient quantities. Examples include heavy metals, pesticides, solvents, and carcinogens.

The following is a general Standard Operating Procedure (SOP) for using toxic chemicals in the workplace. Please note that the specific steps may vary depending on the type of toxic chemical and the workplace requirements.

1. Obtain appropriate training and authorization before handling or using toxic chemicals.
2. Identify the hazards associated with the toxic chemical, including health effects, flammability, explosiveness, and reactivity.
3. Follow all safety procedures and wear appropriate personal protective equipment (PPE), including gloves, goggles, and a respirator, as required.
4. Use the toxic chemical in a well-ventilated area, such as a fume hood, to minimize exposure to fumes and vapors.
5. Store the toxic chemical in a secure, well-labeled container and in a designated storage area that is suitable for the specific chemical.
6. Use the toxic chemical only in the manner and for the purpose intended, following the manufacturer's instructions and guidelines.
7. If the toxic chemical is spilled, follow the appropriate procedures to contain and clean up the spill, including wearing appropriate PPE, using absorbent materials, and properly disposing of the contaminated materials.
8. Avoid eating, drinking, or smoking in areas where toxic chemicals are used, handled, or stored.
9. Wash your hands and any other exposed skin thoroughly after handling toxic chemicals.
10. Properly dispose of the toxic chemical and any contaminated materials according to the applicable regulations and guidelines.

By following these procedures, you can minimize the risks associated with handling or using toxic chemicals in the workplace.

B. Flammable chemicals:

These are chemicals that can catch fire or explode when exposed to a flame or spark. Examples include gasoline, propane, and alcohol.

The following is a general Standard Operating Procedure (SOP) for using flammable chemicals in the workplace. Please note that the specific steps may vary depending on the type of flammable chemical and the workplace requirements.

1. Obtain appropriate training and authorization before handling or using flammable chemicals.
2. Identify the hazards associated with the flammable chemical, including its flashpoint, flammability range, and reactivity.
3. Follow all safety procedures and wear appropriate personal protective equipment (PPE), including gloves, goggles, and a flame-resistant lab coat, as required.
4. Use the flammable chemical in a well-ventilated area, away from ignition sources, and use spark-proof tools.
5. Store the flammable chemical in a secure, well-labeled container and in a designated storage area that is suitable for the specific chemical.
6. Use the flammable chemical only in the manner and for the purpose intended, following the manufacturer's instructions and guidelines.
7. Avoid smoking, open flames, or other ignition sources in areas where flammable chemicals are used, handled, or stored.

C. Corrosive chemicals:

These are chemicals that can cause severe damage to skin, eyes, and other tissues upon contact. Examples include strong acids and bases.

The following is a general Standard Operating Procedure (SOP) for using corrosive chemicals in the workplace. Please note that the specific steps may vary depending on the type of corrosive chemical and the workplace requirements.

1. Obtain appropriate training and authorization before handling or using corrosive chemicals.
2. Identify the hazards associated with the corrosive chemical, including its corrosivity, toxicity, and reactivity.
3. Follow all safety procedures and wear appropriate personal protective equipment (PPE), including gloves, goggles, and an acid-resistant lab coat, as required.
4. Use the corrosive chemical in a well-ventilated area, such as a fume hood, to minimize exposure to fumes and vapors.
5. Store the corrosive chemical in a secure, well-labeled container and in a designated storage area that is suitable for the specific chemical.

6. Use the corrosive chemical only in the manner and for the purpose intended, following the manufacturer's instructions and guidelines.
7. If a corrosive chemical is spilled, immediately follow the appropriate procedures to contain and clean up the spill, including using neutralizing agents, wearing appropriate PPE, and properly disposing of the contaminated materials.
8. Avoid eating, drinking, or smoking in areas where corrosive chemicals are used, handled, or stored.
9. Wash your hands and any other exposed skin thoroughly after handling corrosive chemicals.
10. Properly dispose of the corrosive chemical and any contaminated materials according to the applicable regulations and guidelines.
11. By following these procedures, you can minimize the risks associated with handling or using corrosive chemicals in the workplace.
12. If a flammable chemical is spilled, immediately follow the appropriate procedures to contain and clean up the spill, including turning off any ignition sources, using absorbent materials, and properly disposing of the contaminated materials.
13. Ensure that all containers of flammable chemicals are properly sealed and secured after use.
14. Properly dispose of the flammable chemical and any contaminated materials according to the applicable regulations and guidelines.

    By following these procedures, you can minimize the risks associated with handling or using flammable chemicals in the workplace

D. Highly Reactive chemicals:

These are chemicals that can react with other substances to produce heat, gas, or explosions. Examples include oxidizers, peroxides, and unstable compounds.

The following is a general Standard Operating Procedure (SOP) for using highly reactive chemicals in the workplace. Please note that the specific steps may vary depending on the type of highly reactive chemical and the workplace requirements.

1. Obtain appropriate training and authorization before handling or using highly reactive chemicals.
2. Identify the hazards associated with the highly reactive chemical, including its reactivity, flammability, explosiveness, and potential for hazardous byproducts.
3. Follow all safety procedures and wear appropriate personal protective equipment (PPE), including gloves, goggles, and a respirator, as required.
4. Use the highly reactive chemical in a well-ventilated area, away from ignition sources, and use spark-proof tools.
5. Store the highly reactive chemical in a secure, well-labeled container and in a designated storage area that is suitable for the specific chemical.
6. Use the highly reactive chemical only in the manner and for the purpose intended, following the manufacturer's instructions and guidelines.

7. Always perform a small-scale test before performing any reaction or procedure involving the highly reactive chemical.
8. Ensure that the reaction vessel and other equipment used with the highly reactive chemical are compatible with the chemical, and always use appropriate engineering controls.
9. Have an emergency plan in place for dealing with any unexpected reactions or releases of highly reactive chemicals, including an evacuation plan, spill response plan, and personal protective equipment.
10. Properly dispose of the highly reactive chemical and any contaminated materials according to the applicable regulations and guidelines.

By following these procedures, you can minimize the risks associated with handling or using highly reactive chemicals in the workplace.

E. Explosive chemicals:

These are chemicals that can undergo rapid and violent decomposition or combustion. Examples include TNT, nitroglycerin, and C4.

The following is a general Standard Operating Procedure (SOP) for using explosive chemicals in the workplace. Please note that the specific steps may vary depending on the type of explosive chemical and the workplace requirements.

1. Obtain appropriate training and authorization before handling or using explosive chemicals.
2. Identify the hazards associated with the explosive chemical, including its sensitivity to shock, friction, heat, or other ignition sources.
3. Follow all safety procedures and wear appropriate personal protective equipment (PPE), including gloves, goggles, and a blast-resistant lab coat, as required.
4. Use the explosive chemical in a designated area that is suitable for the specific chemical and ensure that the area is free from ignition sources, such as open flames or sparks.
5. Store the explosive chemical in a secure, well-labeled container and in a designated storage area that is suitable for the specific chemical.
6. Use the explosive chemical only in the manner and for the purpose intended, following the manufacturer's instructions and guidelines.
7. Always perform a small-scale test before performing any reaction or procedure involving the explosive chemical.
8. Ensure that the reaction vessel and other equipment used with the explosive chemical are compatible with the chemical, and always use appropriate engineering controls.
9. Have an emergency plan in place for dealing with any unexpected reactions or releases of explosive chemicals, including an evacuation plan, spill response plan, and personal protective equipment.
10. Properly dispose of the explosive chemical and any contaminated materials according to the applicable regulations and guidelines.

By following these procedures, you can minimize the risks associated with handling or using explosive chemicals in the workplace.

F. **Carcinogenic chemicals:**

These are chemicals that have been shown to cause cancer in humans or animals. Examples include asbestos, benzene, and formaldehyde.

The following is a general Standard Operating Procedure (SOP) for using carcinogenic chemicals in the workplace. Please note that the specific steps may vary depending on the type of carcinogenic chemical and the workplace requirements.

1. Obtain appropriate training and authorization before handling or using carcinogenic chemicals.
2. Identify the hazards associated with the carcinogenic chemical, including its carcinogenicity, toxicity, and potential for skin or respiratory sensitization.
3. Follow all safety procedures and wear appropriate personal protective equipment (PPE), including gloves, goggles, and an appropriate respirator, as required.
4. Use the carcinogenic chemical in a well-ventilated area, such as a fume hood, to minimize exposure to fumes and vapors.
5. Store the carcinogenic chemical in a secure, well-labeled container and in a designated storage area that is suitable for the specific chemical.
6. Use the carcinogenic chemical only in the manner and for the purpose intended, following the manufacturer's instructions and guidelines.
7. Avoid skin contact with the carcinogenic chemical and minimize exposure to fumes and vapors.
8. If a spill or release of the carcinogenic chemical occurs, immediately follow the appropriate procedures to contain and clean up the spill, including using neutralizing agents, wearing appropriate PPE, and properly disposing of the contaminated materials.
9. Avoid eating, drinking, or smoking in areas where carcinogenic chemicals are used, handled, or stored.
10. Properly dispose of the carcinogenic chemical and any contaminated materials according to the applicable regulations and guidelines.
11. Monitor your health regularly for signs and symptoms of exposure to carcinogenic chemicals and report any concerns to your supervisor or safety officer.

By following these procedures, you can minimize the risks associated with handling or using carcinogenic chemicals in the workplace.

G. Mutagenic chemicals:

These are chemicals that can cause changes in DNA, potentially leading to genetic mutations or birth defects. Examples include radiation, certain pesticides, and some industrial chemicals.

The following is a general Standard Operating Procedure (SOP) for using mutagenic chemicals in the workplace. Please note that the specific steps may vary depending on the type of mutagenic chemical and the workplace requirements.

1. Obtain appropriate training and authorization before handling or using mutagenic chemicals.
2. Identify the hazards associated with the mutagenic chemical, including its mutagenicity, toxicity, and potential for skin or respiratory sensitization.
3. Follow all safety procedures and wear appropriate personal protective equipment (PPE), including gloves, goggles, and an appropriate respirator, as required.
4. Use the mutagenic chemical in a well-ventilated area, such as a fume hood, to minimize exposure to fumes and vapors.
5. Store the mutagenic chemical in a secure, well-labeled container and in a designated storage area that is suitable for the specific chemical.
6. Use the mutagenic chemical only in the manner and for the purpose intended, following the manufacturer's instructions and guidelines.
7. Avoid skin contact with the mutagenic chemical and minimize exposure to fumes and vapors.
8. If a spill or release of the mutagenic chemical occurs, immediately follow the appropriate procedures to contain and clean up the spill, including using neutralizing agents, wearing appropriate PPE, and properly disposing of the contaminated materials.
9. Avoid eating, drinking, or smoking in areas where mutagenic chemicals are used, handled, or stored.
10. Properly dispose of the mutagenic chemical and any contaminated materials according to the applicable regulations and guidelines.
11. Monitor your health regularly for signs and symptoms of exposure to mutagenic chemicals and report any concerns to your supervisor or safety officer.

By following these procedures, you can minimize the risks associated with handling or using mutagenic chemicals in the workplace.

H. Pyrophoric Chemicals:

Pyrophoric Chemicals are substances that ignite spontaneously in air at or below 55°C (131°F) without any external ignition source, such as a spark or flame. These materials can also ignite upon contact with moisture or other chemicals.

Pyrophoric substances include some organometallic compounds, such as alkyl and aryl derivatives of alkali metals, as well as some metal powders, such as aluminum, magnesium, and titanium. Pyrophorics are often used in industrial processes such as chemical synthesis, and they require special handling and storage procedures to prevent accidents.

Due to their reactivity and potential hazards, pyrophorics should only be used by trained professionals with appropriate safety equipment and procedures in place.

The following is a general standard operating procedure (SOP) for handling pyrophoric chemicals. However, please note that the specific SOP may vary depending on the specific pyrophoric material and the facilities in which it is being used. It is important to always follow the manufacturer's instructions and consult with a safety professional before handling any pyrophoric chemicals.

1. Training and awareness: All personnel who will be handling pyrophoric chemicals should receive adequate training and be aware of the potential hazards associated with these materials. This includes the proper use of personal protective equipment (PPE), emergency procedures, and safe handling and storage practices.
2. Appropriate PPE: Proper PPE should be worn at all times when handling pyrophoric chemicals, including flame-resistant lab coats, gloves, and eye protection. Respiratory protection may also be required depending on the specific material.
3. Proper storage: Pyrophoric chemicals should be stored in a cool, dry, and well-ventilated area that is away from any sources of ignition. The storage area should be clearly labeled with the name of the material, its hazards, and any special storage requirements.
4. Safe handling: Pyrophoric chemicals should only be handled by trained personnel who are aware of the specific hazards associated with the material. Handling should be done in a fume hood or other ventilated enclosure to prevent the buildup of flammable vapors. Glassware or other equipment used with pyrophoric chemicals should be pre-dried and kept free of moisture.
5. Emergency procedures: Emergency procedures should be in place in case of a fire or other incident involving pyrophoric chemicals. This should include a fire extinguisher rated for the specific material, as well as an evacuation plan and emergency contact information.
6. Disposal: Pyrophoric chemicals should be disposed of in accordance with all applicable regulations and guidelines. This may include treatment, neutralization, or other methods depending on the specific material and local regulations.

It is important to regularly review and update the SOP for handling pyrophoric chemicals to ensure that all personnel are aware of the potential hazards and are following appropriate safety procedures.

Standard Operating Procedures (SOPs) for Proper Physical Maintenance & Management of Chemical Laboratories:

The type and quantity of toxic and hazardous chemicals utilized, as well as the complexity of laboratory activities, determine the facilities required for chemical laboratories. The scope of the task and the physical facilities used must be compatible to the safety procedures adopted.

Proper Ventilation: The practical laboratories should be well and cross ventilated. Direct airflow from non-laboratory sections into the lab and outflow to the building's exterior is ideal.

Exits: Each chemical laboratory should have minimum two exits available.

Exhaust fans: Exhaust fans must be installed to exhaust air contaminants in chemical laboratories.

Fume Hoods: Fume hoods should be used when working with toxic compounds or compounds with a boiling point below 120°C.

Fire Extinguishers: Each laboratory must have a carbon dioxide or foam fire extinguisher, according to requirement.

Storage of Chemicals: Each chemical laboratory needs to have enough shelf and well-ventilated storage space for chemicals to be properly segregated. A separate flammable liquid storage facility ought to exist. A separate acid room is desirable, but if scarcity of space persists, then a separate and safe cabinet may be used.

Storage of Gas Cylinders: Both when being stored and used, cylinders must be fastened with chains or straps to a wall or lab bench. Storage of cylinders away from heat sources is required. Gas cylinders must always be kept upright and should never be emptied completely.

First Aid Box: Each chemical laboratory must have a handy first aid kit for treating minor wounds and burns.

Proper Colour Coding: Water pipelines and gas pipelines must be coloured as per standard norms.

Emergency Eye wash: Each chemical laboratory must have an eyewash available in case of emergency.

Equipment: Electric and electronic equipment should all be equipped with a fuse or other overload-protection device that will cut off the power in the event that the apparatus malfunctions or is overloaded. SoPs regarding the functioning of all the instruments should be kept handy near the respective instruments.

Calibration: Regular Calibration of the instruments by an authorized entity is a must protocol.

Waste disposal: Working tables should be clutter free with proper distancing between the students. Reagents on the stand should be well labeled. After any practical session, the working tables need to be cleaned and wastes should be properly disposed into the designated bins. Facilities must be offered for the safe disposal of sharp objects, broken glass, and waste chemicals.

MSDS/SDS Compliance: Any toxic chemical container should not be purchased or used without an appropriate identification label and without an accompanying Material Safety Data Sheet (MSDS).

 # KNOW THE FACT

Material Safety Data Sheet (MSDS) / Safety Data Sheet (SDS)

A Material Safety Data Sheet (MSDS) / Safety Data Sheet (SDS) is **a document that contains information on the potential hazards (health, fire, reactivity and environmental) and how to work safely with the chemical product**.

Hazardous Chemicals Placing: Hazardous chemicals ought to be kept apart in a location that is clearly marked and has local exhaust ventilation. Chemicals should be checked for replacement, degradation, and container integrity on a regular basis.

KNOW THE FACT:

The Hazard Communication Standard (HCS) was modified to the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) confirming to the standards of the United Nations (UN).

What is the Globally Harmonized System?

A standardised method for label elements and safety data sheets, as well as agreed-upon criteria for classifying chemical risks, are provided by the Globally Harmonized System (GHS), an international approach to hazard communication. Hazard communication professionals from numerous nations, international organizations, and stakeholder groups negotiated the GHS over the course of several years. The Hazard Communication Standard of OSHA and the chemical categorization and labelling systems of other US agencies are among the key existing systems on which it is based.

The paper "Globally Harmonized System of Classification and Labeling of Chemicals," also known as **"The Purple Book,"** is the outcome of these negotiations. This paper offers standardised classification standards for chemical risks to human health, physical safety, and the environment. Additionally, In order to communicate the risks to users, it also provides standardised label elements that are assigned to various hazard groups and categories. various label elements include the suitable signal words, pictograms, and hazard and precautionary statements. Additionally, a standardised format for safety data sheets' (SDS) content is offered. Although they do not represent a model rule, these ideas can be used by regulatory bodies like Occupational Safety and Health Administration (OSHA) to impose strict guidelines for danger communication.

It's best to avoid storing hazardous chemicals in direct proximity to the working tables. Avoid these chemicals being exposed to heat or direct sunshine. Regular inventory must be done, and unused items must be either discarded or put back into storage.

Robust Monitoring System: The labs must be regularly managed by the lab technicians and lab attendants and monitored the associated faculties. In case of any emergency, that has to be immediately brought into the notice of Head of the Department as well as Head of the Institute. Regular surveillance should also be done through CCTV Cameras by the HoDs, when labs are running.

Hazard Communication

This is the standard that gave workers the right to know, now gives them the right to understand.

The Hazard Communication Standard (HCS) is now aligned with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). This update to the Hazard Communication Standard (HCS) will provide a common and coherent approach to classifying chemicals and communicating hazard information on labels and safety data sheets.

A safety datasheet (SDS) is a document that provides detailed information about hazardous chemicals, substances, or products. It is a standardized form of communication that is used to convey information about the potential hazards, health effects, safe handling, storage, and disposal of such materials. GHS provides a standardized system for the classification and labeling of hazardous chemicals.

As per GHS, the safety datasheet (SDS) for chemical hazards must include the following 16 point information:

1. **Identification of the substance or mixture and the supplier:** This section includes the product name, manufacturer or supplier's name, address, and contact information.
2. **Hazards identification:** This section identifies the hazards associated with the substance or mixture, including the nature of the hazards, the relevant target organs, and the appropriate precautionary statements.
3. **Composition/information on ingredients:** This section lists the chemical name, CAS number, and concentration of all hazardous ingredients in the substance or mixture.
4. **First-aid measures:** This section provides instructions for first aid in case of exposure to the substance or mixture, including symptoms of exposure, emergency procedures, and necessary medical attention.
5. **Fire-fighting measures:** This section provides information on the appropriate fire-fighting measures, including suitable extinguishing media, protective equipment, and other precautions.
6. **Accidental release measures:** This section provides information on the appropriate measures to be taken in case of accidental release or spill, including procedures for containment and cleanup.
7. **Handling and storage:** This section provides information on the safe handling, storage, and transport of the substance or mixture, including appropriate protective equipment and precautions.
8. **Exposure controls/personal protection:** This section provides information on the appropriate exposure limits, engineering controls, and personal protective equipment needed to prevent exposure to the substance or mixture.
9. **Physical and chemical properties:** This section provides information on the physical and chemical properties of the substance or mixture, including appearance, odor, pH, boiling point, melting point, and other relevant properties.
10. **Stability and reactivity:** This section provides information on the stability and reactivity of the substance or mixture, including potential hazardous reactions and conditions to avoid.
11. **Toxicological information:** This section provides information on the toxicological properties of the substance or mixture, including acute and chronic effects, exposure limits, and potential health hazards.
12. **Ecological information:** This section provides information on the potential environmental hazards of the substance or mixture, including potential effects on water, air, and soil.

13. **Disposal considerations:** This section provides information on the safe disposal of the substance or mixture, including waste disposal methods and regulatory requirements.
14. **Transport information:** This section provides information on the safe transport of the substance or mixture, including transportation classification and packaging requirements.
15. **Regulatory information:** This section provides information on the regulatory status of the substance or mixture, including applicable regulations, restrictions, and hazard classifications.
16. **Other information:** This section provides any additional information that is not covered by the previous sections but is relevant to the safe handling, use, or disposal of the substance or mixture.

Other information: This section provides any additional information that is not covered by the previous sections but is relevant to the safe handling, use, or disposal of the substance or mixture.

Labeling of Chemicals Protocol:

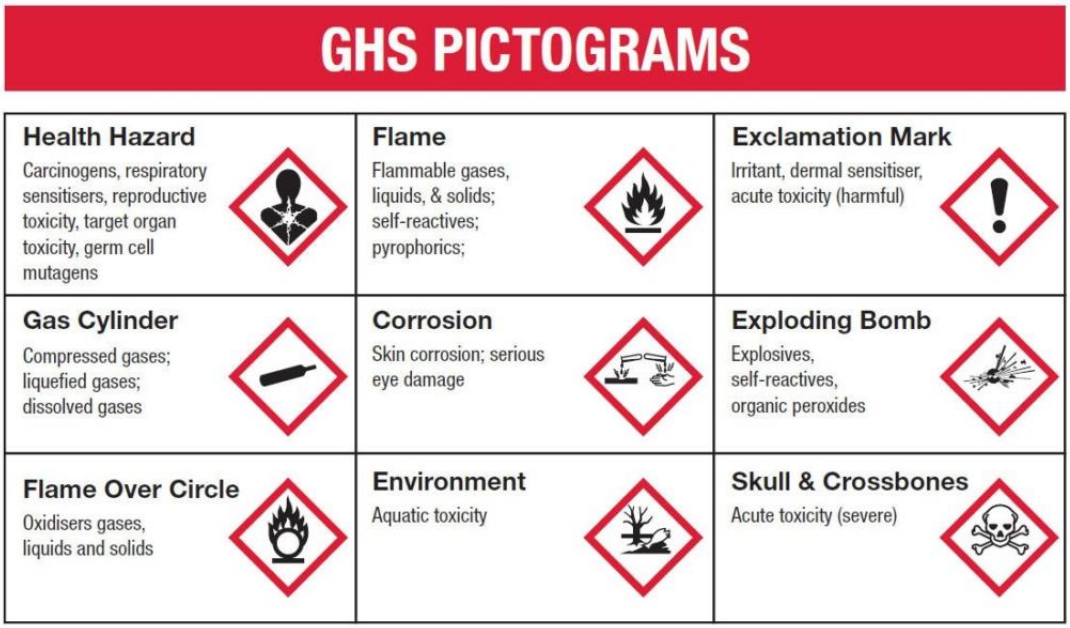
Labeling hazardous chemicals is important to ensure the safe handling and use of chemicals in workplaces and other settings. The labeling protocol for hazardous chemicals typically follows the guidelines set forth by the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Here are the basic steps involved in labeling hazardous chemicals:

1. **Identify the hazardous chemicals:** Determine which chemicals in your workplace are hazardous according to the criteria established by GHS.
2. **Choose the appropriate label:** There are different types of labels depending on the hazards associated with the chemical, such as flammable, corrosive, toxic, etc. Choose the label that best represents the hazards associated with the chemical.
3. **Create the label:** The label should include the following information:
4. **Product identifier: T**he name or code that identifies the chemical.
5. **Signal word:** A word such as "danger" or "warning" that indicates the severity of the hazard.
6. **Hazard statement:** A brief statement that describes the nature of the hazard.
7. **Precautionary statement**: Instructions for safe handling and use of the chemical.
8. **Supplier identification:** The name, address, and phone number of the supplier.
9. **Affix the label:** The label should be affixed to the container holding the hazardous chemical in a prominent and visible location.
10. **Review and update labels:** Review labels periodically to ensure they remain accurate and up-to-date. Update labels as needed if new hazards are identified or if the chemical is used in a new way that creates different hazards.

Following these steps will help ensure that hazardous chemicals are handled safely and in compliance with relevant regulations and standards.

In order to ensure chemical safety in the workplace, information about the identities and hazards of the chemicals must be available and understandable to all students, research scholars faculties and lab supervisor and attendants.



Storage of Chemicals:

Proper storage of chemicals is important to minimize the risk of accidents, such as fires, explosions, and chemical spills. Here are some guidelines for the safe storage of chemicals:

- **Identify the hazards:** Different chemicals have different hazards and require different storage conditions. Before storing any chemical, read the Safety Data Sheet (SDS) and label to determine the appropriate storage requirements.

- **Choose the appropriate storage location:** Chemicals should be stored in a well-ventilated area away from direct sunlight, heat sources, and incompatible materials. Store chemicals on sturdy, stable shelves or in appropriate cabinets.
- **Label and segregate chemicals:** Label all containers with the chemical name, hazard class, and any other relevant information. Segregate chemicals based on their hazard class to prevent incompatible materials from coming into contact with each other.
- **Use appropriate containers:** Store chemicals in appropriate containers made of compatible materials, such as glass or plastic. Make sure the containers are tightly sealed to prevent leaks or spills.
- **Store flammable liquids safely:** Flammable liquids should be stored in approved flammable liquid storage cabinets or other approved containers. Keep them away from sources of ignition, such as open flames and sparks.
- **Use secondary containment:** Use secondary containment, such as trays or basins, to contain spills and leaks. This will prevent chemicals from spreading to other areas.
- **Keep an inventory:** Keep an inventory of all chemicals stored on-site. This will help prevent overstocking and ensure that chemicals are used before their expiration dates.
- **Unused Chemicals:** Never put unused chemicals back in their original containers since they could be contaminated with other substances that could react chemically.
- **Recycling empty containers:** Avoid recycling empty containers since they can still contain dangerous chemical residues.

KNOW THE FACT

Some examples of incompatible chemicals:

- **Acids and bases:** Mixing an acid and a base can result in a violent exothermic reaction, releasing heat, gas, and potentially causing an explosion.
- **Oxidizers and reducers:** Combining oxidizing and reducing agents can generate heat and gas, leading to fire or explosion.
- **Chlorine bleach and ammonia:** Mixing these substances can produce toxic vapors, which can cause respiratory damage or even death.
- **Strong acids and flammable liquids:** Mixing strong acids with flammable liquids can cause a violent reaction, producing heat and gas, and increasing the risk of fire or explosion.
- **Cyanides and acids:** Mixing cyanides with acids can produce highly toxic hydrogen cyanide gas, which can cause respiratory and neurological damage.

- **Avoiding incompatible chemicals keeping together:** Incompatible chemicals are substances that can react with each other in a way that produces hazardous conditions

such as heat, gas, fire, explosion, or toxic release. Mixing incompatible chemicals can result in a variety of hazards, ranging from mild irritation to life-threatening situations.

It is important to follow the safety data sheet (SDS) and label instructions for all chemicals used in your workplace or laboratory. Proper storage, handling, and disposal of incompatible chemicals are critical for preventing accidents and protecting workers from hazardous exposures.

If you are unsure about the compatibility of two chemicals, consult the SDS or contact a safety professional or chemical manufacturer for advice.

Following these guidelines will help ensure that chemicals are stored safely and in compliance with relevant regulations and standards. Regular inspection and maintenance of storage areas are also important to identify and address any potential hazards.

Measures for Spill Control:

Spill control is a critical aspect of laboratory safety, particularly in chemistry labs where hazardous chemicals are frequently used. Here are some general spill control guidelines to follow in a chemistry lab:

- Wear appropriate personal protective equipment (PPE), such as gloves, goggles, and a lab coat, when handling chemicals.
- Before starting any experiment, familiarize yourself with the properties of the chemicals you will be working with and their potential hazards.
- Use a spill tray or other containment device to prevent spills from spreading. Keep absorbent materials, such as spill pads or kitty litter, on hand to contain and clean up spills.
- In case of a small spill, use absorbent materials to contain and clean up the spill. Avoid using a vacuum or broom, which can cause the spill to spread or release hazardous fumes.
- For larger spills, alert your lab supervisor and evacuate the area immediately. Follow your lab's emergency procedures, which may include using a spill kit or contacting a hazardous waste disposal service.
- After cleaning up a spill, dispose of any contaminated materials appropriately. Follow your lab's waste disposal procedures to ensure that hazardous waste is handled safely and legally.
- Electrical switches nearby should not be operated if flammable vapours are present.
- Where it is safe to do so, attempt to extinguish open flames.

Safety Equipment in a Chemistry Laboratory:

Chemistry labs can be hazardous environments, so it's important to wear appropriate safety equipment to protect yourself from any potential hazards. Here are some of the most important safety equipment items you should consider wearing in a chemistry lab:

Lab coat: A lab coat provides full body coverage and is designed to protect your clothing from spills, splashes, and other hazards. It's important to wear a lab coat that fits well and is made from a material that's appropriate for the chemicals you'll be working with.

Gloves: Gloves are essential for protecting your hands from chemical spills and exposure. Choose gloves that are made from a material that's appropriate for the chemicals you'll be working with, and make sure they fit snugly without being too tight.

Safety goggles: Safety goggles protect your eyes from chemical splashes, fumes, and other hazards. Make sure your goggles fit snugly and provide full coverage around your eyes.

Face shield: A face shield can provide additional protection for your face and eyes. It's particularly useful when working with large amounts of chemicals or performing experiments that could create a lot of splashes or aerosols.

Respirator: If you'll be working with chemicals that produce harmful fumes or dust, you may need to wear a respirator. Respirators come in different types and provide different levels of protection, so it's important to choose the right one for your needs.

Closed-toe shoes: Wear closed-toe shoes that provide good support and have non-slip soles. This will protect your feet from spills and other hazards.

Apron: If you'll be working with particularly hazardous chemicals, an apron can provide an extra layer of protection. Make sure the apron is made from a material that's appropriate for the chemicals you'll be working with.

 # KNOW THE FACT

Fire extinguisher: types & Classes

Each of the four types of fire extinguishers—A, B, C, and D—can put out a particular kind of fire.

Class A Extinguishers: Will put out fires in common combustibles such wood, fabric, rubber, paper, and many types of plastic.

Class B Extinguishers: Are meant to be used on flammable liquids including grease, petrol, solvents, lacquers, alcohols and other compounds of a like kind.

Class C Extinguishers: Are meant for used on fires involving electrical equipment.

Class D Extinguishers: Are intended for use on flammable metallic materials like potassium and sodium.

Multiple Class Extinguishers: Those labelled A-B, B-C, or A-B-C, can be used to put out different kinds of flames.

Fire extinguishers: Fire extinguishers are a primary means of extinguishing small fires before they escalate into large ones. Different types of fire extinguishers are designed to put out different types of fires, so make sure you have the appropriate type(s) for the materials you're working with.

 # KNOW THE FACT

Fire extinguisher: How to Operate?

A, B, C, and D are the four classes of fire extinguishers, and each is relatively simple to use in the event of a fire. The **P.A.S.S. method** is used to operate the majority of fire extinguishers:

P. Pull the pin on the fire extinguisher in order to break the tamper seal.

A. Aim the fire extinguisher low, with the nozzle pointed at the base of the fire.

S. Squeeze the handle of the fire extinguisher to release the extinguishing agent.

S. Sweep the nozzle from side to side while pointed at the base of the fire until it is extinguished.

Fire blankets: Fire blankets can be used to smother small fires or to wrap around a person whose clothes have caught fire. They're particularly useful for extinguishing fires caused by flammable liquids.

Sand buckets: Sand buckets can be used to smother small fires caused by flammable solids. Keep a bucket of dry sand near your work area for quick access in case of a fire.

Chemical spill kits: Chemical spill kits are important for containing and cleaning up chemical spills, which can be a fire hazard. Make sure you have a spill kit that's appropriate for the chemicals you're working with and that you know how to use it properly.

Emergency showers and eye wash stations: Emergency showers and eye wash stations are important for rinsing off any chemicals that may have splashed onto your skin or eyes. Make sure these devices are easily accessible and in good working condition.

Remember that these are just some of the safety equipment items you may need to wear in a chemistry lab. Always follow your lab's safety protocols and use any additional safety equipment recommended by your instructor or supervisor.

Handling Emergency Situations in the Chemical Laboratory:

A. Know the location and proper use of safety equipment:

- **Location and proper use of safety equipment:** Everyone in the lab needs to be aware of where the emergency equipment and exits are located. Be familiar with the location and proper use of safety equipment such as fire extinguishers, safety showers, eyewash stations, and first aid kits.
- **Accessibility:** Make sure that safety equipment is easily accessible and in good working order.
- **Emergency phone numbers** : Emergency phone numbers must be prominently displayed.

B. Splashes in Skin & Eyes:

In the event of a chemical splash on the skin or eyes, it is important to take immediate action to minimize the damage. Here are some general guidelines for providing first aid in case of chemical splashes:

For skin splashes:

- **Remove contaminated clothing:** If the chemical has spilled on clothing, remove the clothing immediately to prevent further exposure.
- **Flush the affected area with water:** Use a safety shower or eyewash station to flush the affected area with running water for at least 20 minutes. If a shower or eyewash station is not available, use a hose, faucet, or other source of running water.
- **Seek medical attention:** Even if the skin does not appear to be injured, seek medical attention as soon as possible to ensure that there is no underlying damage.
- **Cover the affected area:** If the affected area is not too sensitive or painful, cover it with a clean, dry bandage to protect it from further contamination.

For eye splashes:

- **Flush the affected eye with water:** Use an eyewash station to flush the affected eye with running water for at least 20 minutes. If an eyewash station is not available, use a faucet, hose, or other source of running water.

- **Hold the eye open:** Use your fingers to hold the eye open while flushing with water to ensure that the water reaches all areas of the eye.
- **Seek medical attention:** Even if the eye appears to be okay, seek medical attention as soon as possible to ensure that there is no underlying damage.
- **Cover the unaffected eye:** If only one eye is affected, cover the unaffected eye with a clean, dry bandage to prevent it from being contaminated.

C. Inhalation of chemical gases:

Inhalation of chemical gases can be dangerous and requires immediate action to minimize the damage. Here are some general guidelines for providing first aid in case of chemical gas inhalation:

- **Move to a well-ventilated area:** Move the affected person to an area with fresh air immediately. If possible, open windows or doors to increase ventilation.
- **Remove contaminated clothing:** If the person's clothing is contaminated with chemical gases, remove the clothing immediately to prevent further exposure.
- **Seek medical attention:** Even if the person does not appear to be injured, seek medical attention as soon as possible to ensure that there is no underlying damage.
- **Administer oxygen:** If the person is having difficulty breathing, administer oxygen if it is available. If you are not trained to do so, wait for medical professionals to arrive.
- **Monitor the person's condition:** Watch the person closely for any signs of distress, such as difficulty breathing, coughing, or wheezing. If the person's condition worsens, seek medical attention immediately.

D. Ingestion of chemicals

Ingestion of chemicals can be very dangerous and requires immediate action to minimize the damage. Here are some general guidelines for providing first aid in case of chemical ingestion:

- **Call for emergency medical help:** Call the emergency services or poison control center immediately. Provide as much information as possible, including the type of chemical and the amount ingested.
- **Do not induce vomiting:** In some cases, inducing vomiting may make the situation worse. Do not attempt to induce vomiting unless instructed to do so by a medical professional or poison control center.
- **Drink water:** If the chemical is not caustic or corrosive, encourage the affected person to drink water or milk to help dilute the chemical and prevent further absorption.
- **Do not give anything by mouth:** Do not give the affected person any food or drink unless instructed to do so by a medical professional or poison control center.

- **Monitor the person's condition:** Watch the person closely for any signs of distress, such as difficulty breathing, coughing, or wheezing. If the person's condition worsens, seek medical attention immediately.

E. Clothing catches fire:

If clothing catches fire, it is important to act quickly to extinguish the flames and prevent further injury. Here are some general guidelines for providing first aid in case of clothing catching fire:

- **Stop, drop, and roll:** If the person's clothing catches fire, tell them to stop, drop to the ground, and roll back and forth to extinguish the flames.
- **Smother the flames:** If the person is unable to stop, drop, and roll, or if the flames are not extinguished by rolling, use a blanket, jacket, or other non-synthetic material to smother the flames.
- **Call for emergency medical help:** Call the emergency services immediately, even if the person appears to be uninjured.
- **Remove burned clothing:** Once the flames have been extinguished, remove any burned clothing that is not sticking to the skin. Do not attempt to remove clothing that is sticking to the skin.
- **Cover the affected area:** Cover the burned area with a clean, dry bandage or cloth to protect it from further contamination.
- **Seek medical attention:** Even if the burns appear to be minor, seek medical attention as soon as possible to ensure that there is no underlying damage.

F. Glassware handling in a chemistry lab :

Glassware handling in a chemistry lab is crucial to ensure safety and accuracy of experiments. Here are some general guidelines for handling glassware in a chemistry lab:

- **Wear appropriate personal protective equipment (PPE):** Always wear gloves, safety glasses, and a lab coat or apron when handling glassware to protect yourself from potential cuts or exposure to chemicals.
- **Inspect glassware before use:** Inspect glassware for any cracks, chips, or other damage before using it. Discard any damaged glassware and do not use it for experiments.
- **Handle glassware with care:** Glassware can be fragile and easily breakable, so handle it with care. Use proper grips and support when carrying or moving glassware, and avoid unnecessary rough handling.

- **Use proper cleaning methods:** Use appropriate cleaning methods to avoid damaging or breaking glassware. Use mild soap and water or an appropriate cleaning solution, and avoid using abrasive materials or harsh chemicals.
- **Store glassware properly:** Store glassware in a safe and organized manner, with appropriate supports and protections to avoid damage or breakage.
- **Dispose of glassware safely:** Dispose of glassware safely in designated containers. Do not discard broken or damaged glassware in the regular trash.
- **When heating,** test tubes must be held properly in a test-tube holder with the mouth directed away from the user and others, and they must not be filled more than halfway.

G. Housekeeping in a chemical laboratory:

Housekeeping in a chemical lab is essential to maintain a safe and efficient working environment. Here are some general guidelines for maintaining good housekeeping in a chemical lab:

- **Keep the workspace clean and organized:** Clean up spills immediately and keep the workspace free of clutter. Use designated areas to store equipment and chemicals.
- **Label and store chemicals properly:** Store chemicals in designated areas, and label them clearly with the name of the chemical and any necessary hazard warnings. Follow the specific guidelines for storage and disposal provided by your lab or instructor.
- **Dispose of waste properly:** Dispose of waste materials in designated containers, and follow the specific guidelines for disposal provided by your lab or instructor. Do not dispose of hazardous waste in regular trash bins.
- **Clean equipment after use:** Clean equipment thoroughly after use and store it properly to prevent damage or contamination.
- **Keep emergency equipment accessible:** Ensure that emergency equipment, such as fire extinguishers, eye wash stations, and first aid kits, are easily accessible and in good working order.
- **Maintain good ventilation:** Ensure that the lab has good ventilation to prevent the buildup of fumes and vapors, and to maintain a comfortable working environment.

Committee for monitoring Safe laboratory practices:

A committee is constituted with nominated faculties as members under the chairmanship of the Head of the Department. An external member nominated by the HoD also gives its input for better safety.

General safety Instructions for students in the laboratories:

1. Always enter the Chemical Laboratory wearing a proper lab attire, including a lab coat, closed-toe shoes, and safety goggles.
2. Restrain loose clothing and lengthy hair. In the lab, you must always wear shoes.
3. Wearing cotton clothes must be preferred rather than synthetics.
4. Follow all instructions given by your teacher or lab supervisor.
5. Use chemicals and equipment only as instructed and authorized.
6. Avoid tasting or smelling chemicals.
7. Label all containers clearly with the appropriate name and date.
8. If chemicals are splashed in the eyes, immediately flush them with water for a considerable amount of time (15 minutes) and seek medical help and keep the person hydrated.
9. Utilize just those chemicals for which the ventilation system is suitable for its quality.
10. Avoid eating, drinking, smoking, and using cosmetics inside laboratory.
11. Before leaving the lab, carefully wash any exposed skin.
12. To prevent damage, handle and preserve laboratory glassware carefully. Use only intact glasses.
13. It is not permitted to play practical jokes or engage in any behaviour that could alarm, confuse, or distract another lab worker.
14. Avoid beginning a syphon or pipetting with mouth suction.
15. Maintain an organized, clutter-free workspace with all chemicals and tools appropriately labelled and stowed. When an operation is finished or at the conclusion of each day, clean up the work space.
16. Check gloves before each usage, wash them before removing them, and swap them out as needed.
17. Steer clear of doing any indoor solo work. If the processes being carried out in the lab are risky, never work by yourself there.
18. The grounding of all electrical connections is required. Service cords for electrical equipment should be in good shape. The repair of frayed cords or exposed wires must be done by professionals. Do not overload circuits.
19. Keep all organic solvents covered & away from open flames, heating devices, and electrical sparks.
20. Avoid lighting flammable vapours.
21. Do not mix chemicals without permission.
22. Do not use equipment that is unfamiliar to you without proper training.
23. Do not ignore safety warnings or precautions.
24. Do not remove any equipment or chemicals from the lab without permission.
25. Report any accidents or spills immediately to your teacher or lab supervisor.

Glimpses of Training Programme:

Training programme for Laboratory Technicians & Attendants

Convener Dr. Anamika Jain addressing the gathering at training programme

Principal Dr. Suresh T Silawat addressing the Laboratory Technicians & Attendants

Participants visiting various different laboratories for practical hands on training

Chemistry Laboratory	Pharmaceutical Chemistry Laboratory
	
Zoology Laboratory	**Fisheries laboratory**
	
Botany Laboratory	**Explaining fire fighting Device**
	

Participants trained by senior faculties of various Science departments

Dr. R. C. Dixit (Physics Department)

Dr. R. K. Vyas (Microbiology Department)

Fisheries Laboratory

Dr. V. Gadgil (Geology Department)

Glimpses of Chemical laboratory Practices:

Laboratory Orientation training

Training the fresher Lab attendants

Well-ventilated laboratories

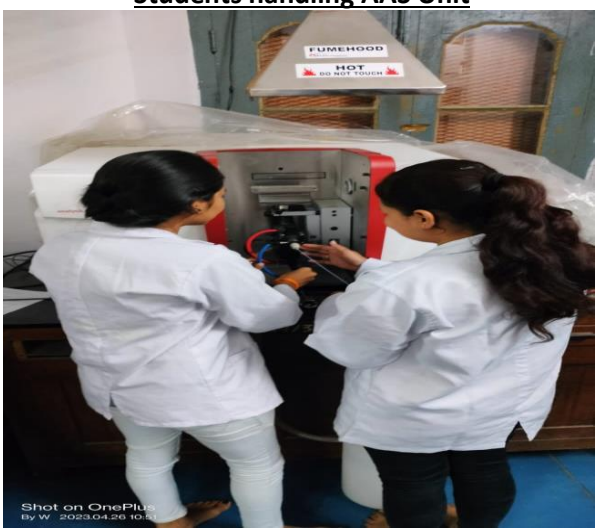
Students performing practical under supervision

Students performing using safety norms

Glimpses of Chemical laboratory (Instrumentation) Practices:

Students handling Gas Chromatography Unit

Students handling AAS Unit



Students handling double beam UV-Visible spectrophotometer

Students handling FT-IR

Students handling HPLC setup

Conclusions:

In conclusion, a hazardous chemical safety policy cum manual is an essential document for any organization that handles hazardous chemicals. This document outlines the safety procedures and protocols that must be followed to ensure the safe handling, storage, and disposal of hazardous chemicals.

The manual includes information about the specific hazards associated with each chemical, appropriate PPE and safety equipment, safe handling procedures, emergency response protocols, and proper disposal methods. It also outlines the responsibilities of personnel involved in handling hazardous chemicals and provide guidelines for training, awareness, and ongoing safety review.

Adherence to the guidelines outlined in the hazardous chemical safety manual cum policy is critical for protecting the health and safety of students, research scholars, faculties and laboratory assistants as well as the environment. The manual should be regularly reviewed and updated to ensure that it remains relevant and effective in addressing new hazards and changes in regulations.

Overall, a well-designed hazardous chemical safety manual cum policy is an important component of any comprehensive safety program, and should be given the highest priority in the management of hazardous chemicals in the institution.

Webliography:

1. https://www.osha.gov/hazcom Accessed June 2022.
2. https://www.ugc.gov.in/oldpdf/xiplanpdf/disposalofradioactiv.pdf Accessed June 2022.
3. https://www.uclahealth.org/safety/classes-of-fires--fire-extinguishers, Accessed June 2022.
4. https://www.prospertx.gov/wp-content/uploads/The-ABCs-of-Fire-Extinguishers.pd_.pdf (PDF), Accessed March 2022
5. https://www.fire-extinguisher.net/fire-extinguisher-inspection-costs_a/284.htm, Accessed March 2022.
6. https://www.firstalert.com/on/demandware.store/Sites-firstalert-Site/default/Content-Show?cid=p-a-s-s-the-fire-extinguisher, Accessed June 2022.
7. https://blog.koorsen.com/cartridge-operated-vs.-stored-pressure-fire-extinguishers, Accessed March 2022.
8. https://www.ssvfd.org/safety/fire-extinguisher-safety/, Accessed March 2022
9. https://www.runwangda.net/know-european-and-international-eyewash-standards/ Accessed March 2022
10. https://cpcb.nic.in/openpdffile.php?id=UmVwb3J0RmlsZXMvOTg4XzE1NzYwNDIwNzdfbWVkaWFwaG90bzE2MTQ0LnBkZg== Accessed June 2022
11. https://cpcb.nic.in/displaypdf.php?id=aHdtZC8zcmRfQW1lbmRtZW50X1J1bGVzLnBkZg== Accessed June 2022

Govt. Holkar (Model Autonomous) Science College, Indore

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[Vasudhaiva Kutumbakam]

Our SDG-2030 Goals Tree

कल्पवृक्षः

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