

Module 3: Chemical Safety and Hazard Management

3.2

Safety Plan for Handling Hazardous Chemicals

Resource Person

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Learning Outcomes

After completing this session, students will be able to:

1. Identify key components of a comprehensive chemical safety plan, including PPE, storage, and emergency protocols.
2. Demonstrate safe handling and disposal procedures for hazardous chemicals in laboratory settings.
3. Apply risk assessment principles to prevent chemical accidents and ensure compliance with safety guidelines.



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Pre-Use Planning

- **Read the Safety Data Sheet (SDS)** for each chemical: hazards, PPE, storage, spill response, and first aid.
- **Conduct a Risk Assessment:**
 - Identify hazards (toxicity, reactivity, flammability, corrosivity).
 - Evaluate routes of exposure (inhalation, skin contact, ingestion).
 - Assign risk level using a **Risk Matrix**.
- **Establish Standard Operating Procedures (SOPs):**
 - Step-by-step instructions for handling and disposal.
 - Emergency procedures included.



Personal Protective Equipment (PPE)

Mandatory PPE includes:

- **Lab coat**, safety goggles/face shield, **nitrile or appropriate gloves**, closed-toe shoes.
- Respiratory protection (if volatile or toxic vapors are involved).

PPE must be inspected before use and replaced as needed.

Safe Handling Procedures

- Work in a **fume hood** when dealing with volatile, toxic, or corrosive substances.
- Use **minimal quantities** to reduce exposure and waste.
- **Avoid pipetting by mouth**; use mechanical devices.
- Label all working solutions immediately.
- Never leave reactions or open chemicals **unattended**.

Chemical Disposal Guidelines

Special Waste Categories

- **Volatile solvents:** Store in flammable waste containers.
- **Heavy metals:** Use dedicated containers; do not mix.
- **Reactive or explosive chemicals:** Handle under expert supervision.

Spill and Exposure Management

- Keep a **spill kit** nearby (absorbents, neutralizers, PPE).
- In case of small spills:
 - Evacuate area if needed.
 - Wear PPE and clean up using kit instructions.
- For **large or dangerous spills**:
 - Evacuate and notify the safety officer or emergency services.
- **Chemical exposure**:
 - Skin: Flush with water for 15–20 minutes.
 - Eyes: Rinse using eyewash station.
 - Inhalation: Move to fresh air.
 - Ingestion: Seek immediate medical help.



Waste Disposal

- Collect chemical waste in **properly labeled containers**.
- **Do not mix incompatible wastes**.
- Store in designated areas and dispose through **authorized agencies**.
- Maintain a **waste logbook**.



Emergency Preparedness

- Ensure access to:
 - **Fire extinguisher**
 - **Eyewash and safety shower**
 - **First aid kit**
- Display emergency contact numbers.
- Train staff on **evacuation plans** and **emergency drills**.