



Chemical Threats Advanced Chemistry Course

SAND2010-3700P

Introduction to Chemistry Laboratory Safety Part 2

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.



Unit Objectives

- **Hazard Recognition**
- **Minimizing Exposure**
- **Labeling Requirements**
- **Safety Equipment Operation**
- **Safety Equipment Location**
- **Lab Operations**

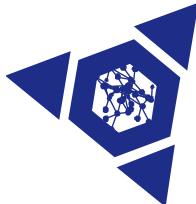




Chemical Hazard Recognition

- **Odor**: Some chemicals are vaporized easily and emit a strong odor
- **Visual Appearance**: Some chemicals may be observed by the visible appearance of the chemical
- **Air monitoring**: In areas where highly toxic substances are present, there may be air monitoring devices that alarm when the concentration of the substances reaches a certain value

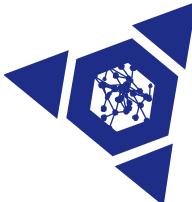




Chemical Hazard Recognition

- **Consult the MSDS!** Read and understand the MSDS *before* you start work with any chemical; the MSDS will provide the information you need to minimize your exposure and recognize hazards.
- **How do I recognize this material?** What odors may I expect? What are this material's properties?
- **How might I feel if I have been exposed?** Headaches? Rash? Dizziness? Nauseous? Coughing? Drowsiness?

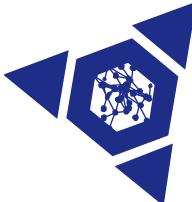




Minimizing Exposure to Chemicals

- **Garment minimums**
- **Personal Protective Equipment**
- **Engineering Controls**
- **Administrative Controls**





Minimizing Exposure to Chemicals

- **Garment minimums**

- Long pants, no shorts
- No open-toed shoes
- Short-sleeved shirts

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- Wear hair tied back
- Avoid wearing contact lenses
 - Vapors can permeate/collect/get trapped under lens
 - Hard to remove if you get something in your eyes
- Comfortable cotton or cotton/poly blends
 - Solvents don't dissolve these materials
 - Won't stick to your skin if clothes catch on fire.

Minimizes exposed skin

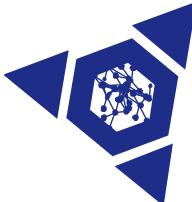




Minimizing Exposure to Chemicals

- **Personel Protective Equipment**
 - Lab coat
 - Eye Protection
 - Safety glasses or goggles
 - Face shield if necessary
 - Gloves
 - Must be appropriate for the job
 - **Unreactive**
 - **Impermeable**
- The lab coat is to keep splashes off of your street clothes, and must be removed and discarded if it gets contaminated.





Laboratory Engineering Controls

Engineering Controls are the devices incorporated into the laboratory design used to minimize your exposure to hazardous chemicals.

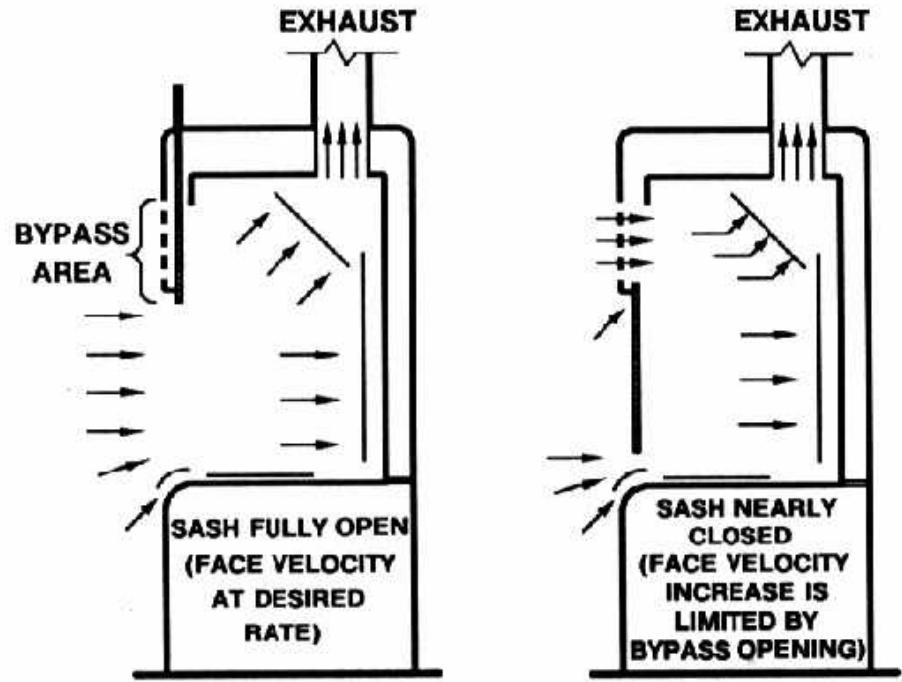




Laboratory Engineering Controls

Engineering Controls
are the devices
incorporated into the
laboratory design used
to minimize your
exposure to hazardous
chemicals.

**Fume hoods, for
example.**





Laboratory Engineering Controls





Personal Deluge Systems

- **Eyewash**
- **Safety showers**



- **Run for 15 minutes minimum.**
- **Hold eyes open in stream**
- **Remove clothing in shower.**





Laboratory Administrative Controls

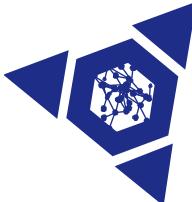
Administrative Controls are the procedural and training processes designed to minimize your exposure to hazardous chemicals.

- Operating Procedures
- Labels and Signs
- Limiting Worker Exposure



(building name & room number, list subrooms, if any)	
Hazards Within:	List hazards such as Flammables, Acids, Bases, General Chemicals, high pressure compressed gases, Biohazards, Radioactive materials, etc
Primary Contact:	(name & office phone)
Second Contact:	(name & office phone)
Building Monitor/Safety:	(name & office phone)
Department Head:	(name & office phone)
Fire/Police/Ambulance:	911
Envir. Health & Safety (or RSO, if needed):	646-3327





Lab Common Sense

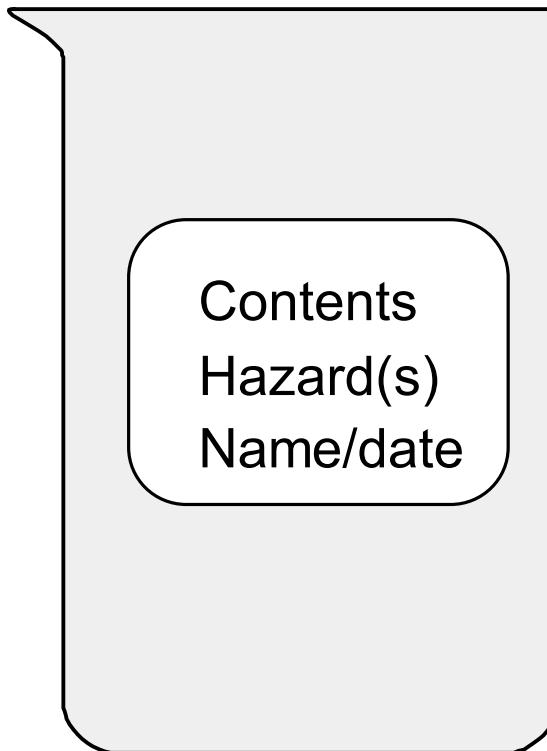
- **No Eating or Drinking in the Lab.**
- **Don't store food in the Lab.**
- **Wash your hands when you leave the Lab.**
- **Don't taste/snort the chemicals.**





Labeling Requirements

When you dispense something into a 'secondary' container; you must label the secondary container with:





Summary

Minimize your exposure to hazardous Chemicals

- **Recognition of Hazards**
- **Personal Protective Equipment**
- **Engineering Controls**
- **Administrative Controls**

