Safety in laboratories

MSU Office of Environmental Health & Safety

Safety at MSU

- MSU Office of Environmental Health & Safety
  - Waste Disposal
  - Laboratory Safety
  - Spill Response
  - Environmental Compliance

- MSU Police
  - Fire Marshal

- Occupational Health Clinic @ Olin
  - Occupational Medical Exams
The Law and you

- OSHA – federal government
- MISOHA – state government
  - MISOHA lab standard
- MSU internal policies

All outline safe work practices and employer/employee responsibilities for making laboratories safe and healthy places to work

Training Requirements for laboratory workers

- Chemical Hygiene/Hazardous Waste Initial
  - Biosafety Principles
  - Compressed Gas/ Cryogen Safety
  - Radiation Safety
  - Occupational Safety
- Lab specific training by PI
- Specialized Training
- Annual Refresher

All Training Must be Documented
Hazards in the Work Environment

- **Radioactive Hazards**
- **Biohazards**
- **Physical Hazards**
  - Temperature
  - Light
  - Noise
  - Electrical
- **Chemical Hazard**
  - Health
  - Physical

Flammables

- Keep flames away from solvents
- Control ignition sources
- No flammables in household refrigerators
- Keep flammables in cabinets

<table>
<thead>
<tr>
<th>Category</th>
<th>Criteria</th>
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<tbody>
<tr>
<td>1</td>
<td>Flash point &lt; 33°C and initial boiling point ≤ 35°C (95°F)</td>
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<tr>
<td>2</td>
<td>Flash point &lt; 23°C and initial boiling point &gt; 35°C (95°F)</td>
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<tr>
<td>3</td>
<td>Flash point ≥ 23°C and ≤ 60°C (140°F)</td>
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<td>4</td>
<td>Flash point ≥ 60°C (140°F) and ≤ 93°C (200°F)</td>
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Flammables and Sources of Ignition

Laboratory Fire
Inoculating loops + open flame + ethanol = fire in biosafety cabinet

Flammable storage
Secure gas cylinders

- Wash hands often
- Do not reuse gloves
- Keep gloves and lab coats in the lab
- Make sure your paperwork is up to date!

Biohazards
Routes of Exposure

- Ingestion
- Inhalation
- Skin Contact

- WASH YOUR HANDS OFTEN!
- Do not eat or drink in the lab
- Do not reuse gloves
- Work in a fume hood with toxics
- Work in a biosafety cabinet with biohazards

Food and Beverage
Radiation

- As isotopes, lasers, UV lights
- Use your PPE
- Report spills and exposures immediately!
- Keep your paperwork up to date!

Emergency Numbers
Lab Specific training and SOPs

- SOPs are Standard Operating Procedures. Describe in detail protocols and safety information.

Personal Protective Equipment

Use this equipment to lower your risk of exposure.
Professional attire

- **Yes!**
  - Closed toe shoes
  - Long pants or skirt
  - Lab coat

- **NO!**
  - shorts
  - sandals, open shoes

Lab Coats Available and Worn
Dress appropriately!

Use gloves, goggles and lab coats!

Gloves Available, in Good Condition

Don’t reuse gloves!

Avoid latex if possible

Don’t touch common areas with gloves on
Ammonia Scar

Caustic Soda Exposure
98% Sulfuric Acid

Eyewash Stations
Broken glass and sharps

- Broken glass goes in designated bucket or box
- Sharps go in a sharps container
- Neither goes in the trash!

Fume Hoods
**Chemical Inventory**

Know what chemicals are OK for you to use

Keep track of the chemicals you buy

Don’t abandon chemicals when your project is finished

**Labeling Basics**

Label containers stored for longer than 1 day with:

- Full Chemical Name of hazardous material
  Or use an abbreviation key

- Hazard warning (flammable, corrosive, etc.)
Hazardous Waste

All waste must:

- Tag completely filled out
- Words “Hazardous Waste” on the container
- Closed lid
- Not start a fire or reaction

Waste management

DO NOT:

- Pour chemicals down the drain
- Throw out biowaste without autoclaving
- Put sharps or broken glass in the trash
No Leaking Containers

Don’t abandon chemicals and samples!
Keep bench top chemicals to a minimum

Excessive Chemicals

TYPE UP LAB REPORT
SPELL CHECK UNDERLINES
HALF OF THE WORDS
Security basics

- Know who is in your lab!
- If you don’t recognize someone, ask who they are
- Keep doors locked behind you
- Don’t loan out your ID card

REMEMBER!

- Report spills and accidents!
- Wear your PPE
- Keep your work area clean
- Manage your waste
- Make sure someone approves new projects
- If you’re not sure, ask!!!!