

CHEM 200

General Laboratory Safety



1

Who am I?

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2



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4

Text Book

- **CRC Handbook of Laboratory Safety, 5th Edition** by A. Keith Furr.

ISBN-10: 0849325234

ISBN-13: 978-0849325236

- **Handbook of Laboratory Health and Safety, 2nd Edition** by R. Scott Stricoff and Douglas B. Walters. Wiley-Interscience

ISBN-10: 047102628X

ISBN-13: 978-0471026280



5

What is safety?

The word **safety** is very often used in the everyday life and have different meaning, but in general, it means the quality or condition of being safe; freedom from danger, injury, or damage.



6

What is laboratory?

A laboratory may be a place of specialized work, research, clinical or diagnostic evaluation, teaching and/or learning. Laboratories are commonly used in many scientific disciplines from chemistry, physics, botany and zoology to medicine, psychology, dentistry, chemical engineering, agriculture and veterinary science.



7

What is Hazard?

A hazard is generally anything that can hurt you or make you ill, or cause damage.



Laboratory Hazard

- Chemical hazard, such as corrosives, flammables, toxics, explosives,...etc
- Biological hazard, such as pathogenic microorganisms, biological tissues, animals.
- Physical hazard, such as noise, radiation.
- Electrical/Mechanical hazard, such as high voltage apparatus, machinery with moving parts.
- Psychological hazard, such as emotional stress.



8

Laboratory Hazard

Therefore, it is very important before entering any lab to identify the sources of hazard and follow the safety rules to protect yourself and to be sure about your safety.



9

Lab safety regulation is very important practice and it is there to do the following:

- Protect the interests of the instructor and students or any one who is attending a lab course.
- Safe-guard against loss of life and property.
- Guarantee individuals right: RIGHT-TO-KNOW (RTK) & RIGHT-TO-BE-INFORMED (RTBI).



10

Primary Laboratory Safety Rules

1. Laboratory working conditions should be safe.
2. Personal protective equipment (PPE) must be of the accepted type for the activity and must be worn correctly at all times by students and instructors.
3. All chemicals and other hazardous materials must be kept in a properly secured area, clearly and appropriately labeled, and accounted for meticulously at all times.
4. Proper equipment and supplies must be provided to students for use. They must be given instructions in laboratory techniques and in handling materials before being allowed to conduct experiments.
5. Instructors must supervise laboratory activities at all times.
6. Emergency telephone numbers appropriate signs including emergency response and evacuation procedures should be conspicuously posted in laboratories.



General lab Safety Rules

1. Work in the lab only when the instructor is present or when you have permission to do so.
2. Listen to or read instructions carefully before attempting to do anything.
3. Identify any source of hazards present in the lab and report to the instructor.



12

4. Learn the location and proper usage of the eyewash fountain, fire extinguisher, safety shower, fire alarm box, office intercom button, evacuation routes, clean-up brush and dust pan, glass/chemical disposal can.



5. Report all accidents regardless of how minor to your instructor.
6. Before beginning work in lab, clean the lab bench top and your glassware.
7. Never indulge in horseplay or behavior that could lead to injury of others.
8. Use goggles and lab coat all the time inside the lab.



9. Read the label on chemical bottles at least twice before using the chemical. Many chemicals have names that are easily confused.



10. Due to the dangers of broken glass and corrosive liquid spills in the lab, open sandals or bare feet are not permitted in the lab.



15

11. If you get any chemical in your eye, immediately wash the eye with the eye-wash fountain and notify the instructor.



12. Never look directly into a test tube. View the contents from the side.



13. For minor skin burns, immediately plunge the burned area into cold water and notify the instructor.

16

14. Never smell a material in a test tube or flask directly. Instead, with your hand, "fan" some of the fumes to your nose carefully.



15. Immediately notify the instructor of any chemical spill and clean up the spill as directed.



16. Never take chemical stock bottles to the lab benches.



17

17. Use equipment only as directed:

a. never place chemicals directly on the pan balances.



b. use glycerin when inserting glass tubing into rubber stoppers.



c. be cautious of glassware that has been heated.

d. add boiling chips to liquid that is to be heated before heating.

e. point test tubes that are being heated away from you and others.



18

16. Never taste any material in the lab

17. Food, drink and gum are prohibited in lab.



No Food or Drinks

- **18.** Never add water to concentrated acid solutions.
- The heat generated may cause spattering.
- Instead, as you stir, add the acid slowly to water.



19

19. Return all lab materials and equipment to their proper places after use.

20. Upon completion of work, wash and dry all equipment, your lab bench and your clean-up area.





20

Washing Hands

Always wash your hands thoroughly to remove any potential chemical residues before you leave the lab.



Symbols and Color Codes

Color	Red	Blue	Yellow	Green
Type	Prohibition Signs	Information Signs	Warning signs	Safe Condition signs
Meaning	Must not do	Must do	Be caution	Do it safely
Example	 Do not use portable telephones	 Foot protection must be worn	 Danger corrosive substance	 Fire exit