



CHEM LAB BASICS

Essentials of lab concepts, use & safety—including helpful hints & tips, plus ways to avoid common pitfalls & dangers

HELPFUL ICONS



Hints



Think Again



Danger



Pitfalls

Use these icons to help navigate to important information!

LAB SAFETY TRAINING

- **Lab skills**—the skill to operate, assemble, or am—does not come naturally to anybody. Success in each of these areas depends on discipline, practice, and training. In the chemistry lab, you encounter new equipment and varied types of chemical materials that require training. If you plan to use these safely.
- **Remember**, details are important in chemistry—and not just where numbers and calculations are concerned. **Chemical names and formulas** present a whole new language. You have to know these symbols and definitions to work in the lab.

H One letter can mean a lot—**chlorine**, with an “n,” is a toxic gas; **sodium chloride**, with a “d,” is a harmless salt.

Safety Training

- **Safety** is an integral part of working in the chemistry lab, and a responsibility shared by students and instructors.
- **Learning about safety** is part of your education skills you gain in the lab. It will serve you in future careers and in life.... If nothing else, they will make you a better cook!

Be Prepared

W What is the lab exit? Every lab should have at least two exits. Know how to get out quickly in an emergency.

H Never work in an isolated “corner” of a lab, upper-floor windows, do not count an emergency exit.

T Where is the nearest phone? You may need to call for help in an emergency. If an, dial 911 or your local emergency number.

D Do not rely on the cell phone in your book bag—it may be on fire!

W What is the fume hood? You’ll need to use it for any odorous reaction.

H Always use a hood when working with concentrated acids or aqueous ammonia. If the chemical has a pungent odor, or is a health risk, you need to use a hood.

W Where are the eyewash station and safety shower? These are for washing acids and/or eyes exposed to chemicals.

W Where is the fire extinguisher? You may need to use it to douse small fires. Check with your instructor on guidelines for using an extinguisher. Some fires require special treatment.

D Sodium reacts with water, a common ingredient in most fire extinguishers.

Personal Responsibility

Rule 1: Safety first Your mistakes will likely harm you more than anyone else. Ask questions if you are not sure how to do something properly.

Rule 2: Read the lab manual before class. Come to lab prepared to work on the assigned experiment.

Rule 3: Always pay attention as you work. Watch other students; you are impacted by their mistakes.

Rule 4: Don’t fool around. Injuries happen when people play jokes or games, or show off in the lab. Repairing broken instruments can cost thousands, and some chemicals are very dangerous if misused or accidentally mixed.

Rule 5: Clean up your own mess. You are a partner in maintaining a safe lab.

Keys to a Clean Lab

- **Keep your workspace clean and organized.**
- **Wash labware** with detergent; rinse with deionized or distilled water. Use a wash bottle to conserve water. Drain excess liquid and allow the labware to dry before storing.
- **Wash shared equipment** before and after each use.
- **After each lab session**, return reagents and equipment to the designated storage area.

GENERAL LAB GUIDELINES

- **Always work with instructor supervision**. Never work in a lab alone.
- **Always wear goggles** in the lab, even over eye-glasses. Replace contact lenses with eyeplugs.

H Contact lenses can absorb solvent vapors. If you do accidentally get chemicals in your eye, the contact lens can actually trap harmful chemicals between the lens and your cornea. So switch to glasses for lab sessions.

W Wear an apron, lab coat, and gloves to limit your chemical exposure and to save clothing from chemical stains.

H Select gloves to match the chemicals that you are using in the lab. Some gloves dissolve in certain organic solvents. Think about what happens when you expose a Styrofoam cup to acetone.

D Unless you want it stained, never wear your favorite new shirt to the lab.

W Wear closed-toe shoes and long pants to protect your feet and legs.

H These precautions provide protection from spilled chemicals and broken glass.

T Tie back hair and avoid bulky items that interfere with work.

H Remove any rings and other jewelry that may lessen your grip on beakers, test tubes, and other equipment. Some jewelry may be damaged by lab chemicals.

D Do not store book bags, cell phones, or other electronic gear on the lab bench. They can interfere with your workspace and could be damaged by a chemical spill or accident.

F Food, drink, and cosmetics should not be brought into the lab.

D You would be eating any chemicals that accidentally get on your food or putting chemicals on your lips with the lipstick.

B Before leaving, wash your hands after each lab session.

D Do not take any lab chemicals home with you, even by accident.

D You definitely do not want chemicals flavoring the burger and potato chips you have after lab!



WORKING WITH CHEMICALS

Heating Labware

U Use tongs to handle labware while it is heated by a burner or brazier.

D Hot lab items do not look hot. Touching hot glassware is a good way to spill the contents.

A Allow the items to cool to room temperature before weighing it.

H Hot items create air currents that alter the reading of a balance.

Liquid Reagent

- **Cover beakers** with watch glasses.
- **Use “boiling stones”** to promote smooth boiling.
- **Flammable solvents**: Take special care when heating flammable liquids with a hot plate; avoid using an open flame.
- **Handle hot tubes** with wire test tube holders.

H Heating a liquid is not a race. Overly rapid heating can cause the solution to erupt into a boil, termed **bumping**, usually resulting in the liquid spilling onto the hot

plate or burner and the lab bench top, making your notebook, etc.

Solid Reagent

- **Use weighing dishes** on balances.
- **Cover weighing dishes** to prevent loss, spill, or contamination.

H Always record lab data in an organized notebook, including the number and unit.



Basics For Chemistry In The Laboratory

Bryan M. Ham, Aihui MaHam



Basics For Chemistry In The Laboratory:

Laboratory Experiments for "Basic Concepts of Chemistry Alan Sherman, Sharon J. Sherman, Leonard Russikoff, 1995-10-01 Chemistry Lab Basics Mark Jackson, BarCharts Inc., Staff, 2001-04-26 This 2 page laminated study guide contains basic chemistry analysis and concepts designed specifically to aid science students It is the ideal companion in any Chemistry lab

Laboratory Experiments for Basic Chemistry Alan Sherman, Sharon Sherman, Leonard Russikoff, 1980-01-01 **Chemistry Lab Basics (Speedy Study Guides)** Speedy Publishing, 2015-01-28 A study guide is an excellent foundation especially when you are pursuing knowledge in science Science is all about facts and provable information In chemistry you study a lot of compounds and combinations of information and without the building blocks you ve got nothing to work with Getting help with those harder concepts and reminding yourself of the easy ones can save your life and make it easier to pass those classes or spark a passion

A Survey of the Forensic Sciences Randall Skelton, 2011-01-14 Exploring the broad spectrum of the forensic sciences practiced both inside and outside of a crime lab this text investigates forensic sciences that are used both in criminal and civil contexts along with non traditional and new applications such as occupational fraud wildlife protection and homeland security The approach is unifying in that it seeks to explain the underlying theoretical and practical concepts that unite all forensic science as well as the individual challenges of each of the forensic sciences The scientific concepts that underly the forensic sciences are explained in a manner that is understandable by readers without a science background

Basic Chemistry Concepts and Exercises John Kenkel, 2011-07-08 Chemistry can be a daunting subject for the uninitiated and all too often introductory textbooks do little to make students feel at ease with the complex subject matter Basic Chemistry Concepts and Exercises brings the wisdom of John Kenkel s more than 35 years of teaching experience to communicate the fundamentals of chemistry in a practical down to earth manner Using conversational language and logically assembled graphics the book concisely introduces each topic without overwhelming students with unnecessary detail Example problems and end of chapter questions emphasize repetition of concepts preparing students to become adept at the basics before they progress to an advanced general chemistry course Enhanced with visualization techniques such as the first chapter s mythical microscope the book clarifies challenging abstract ideas and stimulates curiosity into what can otherwise be an overwhelming topic Topics discussed in this reader friendly text include Properties and structure of matter Atoms molecules and compounds The Periodic Table Atomic weight formula weights and moles Gases and solutions Chemical equilibrium Acids bases and pH Organic chemicals The appendix contains answers to the homework exercises so students can check their work and receive instant feedback as to whether they have adequately grasped the concepts before moving on to the next section Designed to help students embrace chemistry not with trepidation but with confidence this solid preparatory text forms a firm foundation for more advanced chemistry training

Analytical Chemistry Bryan M. Ham, Aihui Ma Ham, 2024-03-12 ANALYTICAL CHEMISTRY

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An Index to Undergraduate Science National Science Foundation (U.S.). Office of Experimental Projects and Programs, 1974

General Chemistry Laboratory Manual and Notebook Philip Borer, 2020-07-10

Laboratory Manual for Introductory Chemistry Charles H. Corwin, 2018-01-05 For lab courses in introductory preparatory and basic chemistry Prepare introductory chemistry students for laboratory and provide a safe experience Emphasizing environmental considerations Corwin's acclaimed Laboratory Manual for Introductory Chemistry offers a proven format of a pre laboratory assignment a stepwise procedure and a post laboratory assignment More than 500 000 students to date in Introductory Chemistry Preparatory Chemistry and Allied Health Chemistry have used these experiments successfully The 7th Edition continues to evolve with increased sensitivity to environmental and safety concerns in the laboratory Recycle icons in the margin of each procedure alert students to recycle chemical waste and green chemical indicators remind students to use the appropriate waste containers provided to dispose of chemicals Corwin's lab manual can be packaged with any Pearson Intro Prep Chemistry book

The Essentials of Geometry (plane) Webster Wells, 1898

Analytical Chemistry

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