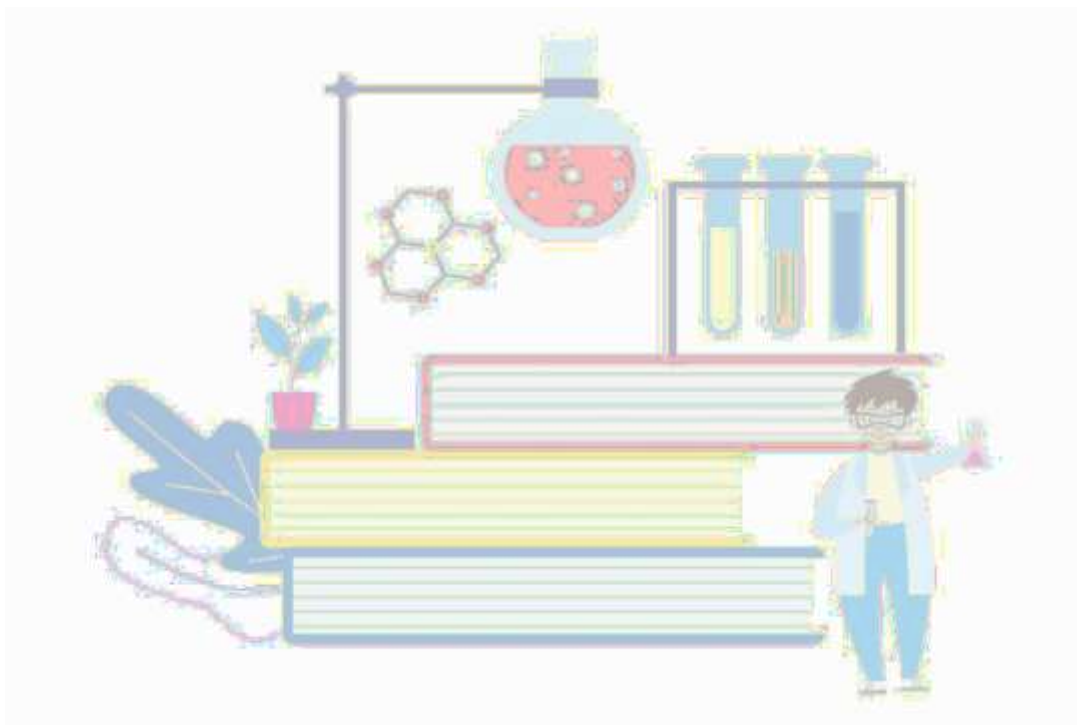




# Practical General Chemistry 1



**First Year (2024-2025)**

**Prepared by Dr. Sameer Awad & Mr. Mohammed Hashim**

**General rules for working in Chemistry Lab**

## ***Introduction***

The Analytical chemistry laboratory manual for the student of chemical engineering department include the most important types of chemical glassware with their nomenclature, Chemical Safety in the Laboratory Conduct and describes the experimental procedures with a brief theoretical background and chemical equations.

### ***Laboratory Report:***

1. Cover Page: Title of the experiment, identify yourself and your partners and Date of Performing the experiment.
2. Purpose or Objective
3. Theoretical Basis.
4. Apparatus and materials required.
5. Results and calculation.
6. Discussion.
7. References.



## *Safety in the Laboratory*

There are a number of rules that must be followed in order to work safely in a chemical laboratory. Some of these rules are listed below.

1. Always wear your laboratory such as (a lab coat, gloves, goggles and shoes) while working in the laboratory.



2. Always check the label on the bottle before using a chemical reagent.



3. Never taste a chemical or a solution, many laboratories' chemicals are toxic.



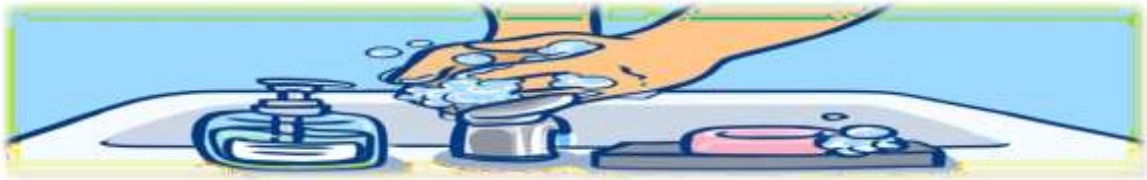
4. Keep your face at a safe distance if your experiment generates an objectionable gas. Work under the suction hood.



5. Don't pick hot objects with your bare hand.



6. Wash your hands well before leaving the laboratory.



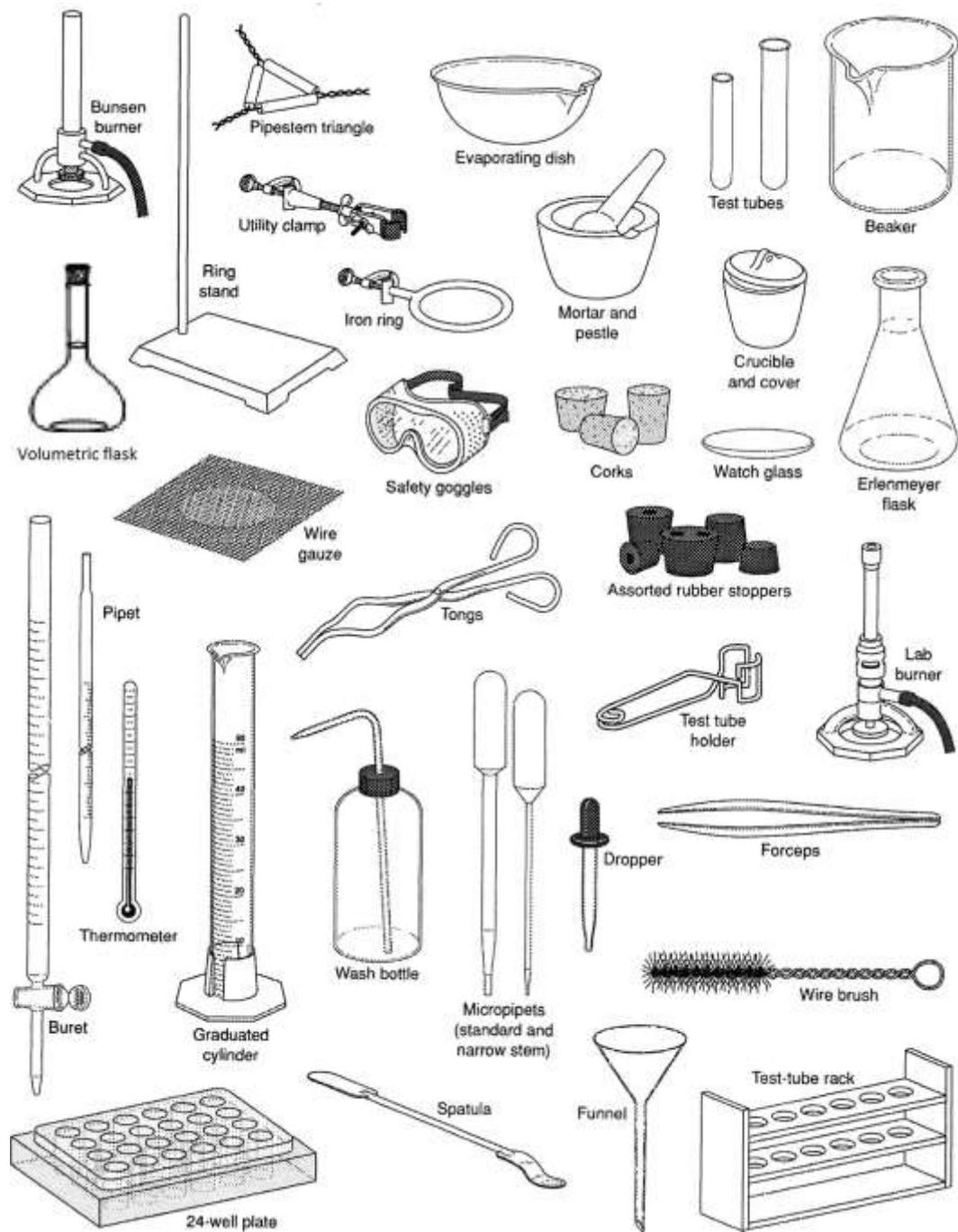
7. **always add acid to water. Never add water to acid?**

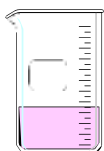
To avoid the spattering of acids which can cause burns.



8. Avoid using bare hands in the transfer of chemicals.
9. Before obtaining any reagents, carefully read the labels on the bottles twice. Many chemicals have similar names or concentrations may vary.
10. Never back unused chemicals to the original bottle.

## Chemistry Laboratory Common Equipment





**Beakers** are useful as a reaction container or to hold liquid or solid samples. They are also used to catch liquids from titrations and filtrates from filtering operations.



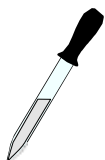
**Bunsen Burners** are sources of heat.



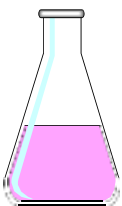
**Burets** are for addition of a precise volume of liquid. The volume of liquid added can be determined to the nearest 0.01 mL with practice.



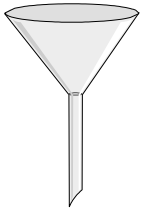
**Clay Triangles** are placed on a ring attached to a ring stand as a support for a funnel, crucible, or evaporating dish.



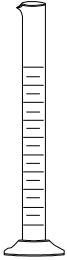
**Droppers** are for addition of liquids drop by drop.



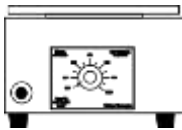
**Erlenmeyer Flasks** are useful to contain reactions or to hold liquid samples. They are also useful to catch filtrates.



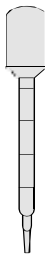
**Glass Funnels** are for funneling liquids from one container to another or for filtering when equipped with filter paper.



**Graduated Cylinders** are for measurement of an amount of liquid. The volume of liquid can be estimated to the nearest 0.1 mL with practice.



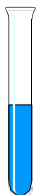
**Hot Plates** can also be used as sources of heat when an open flame is not desirable.



**Pipets** are used to dispense small quantities of liquids.



**Ring stand with Rings** are for holding pieces of glassware in place.



**Test Tubes** are for holding small samples or for containing reaction.



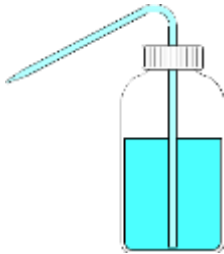
**Test tube holders** are for holding test tubes when tubes should not be touched



**Tongs** are similar in function to forceps but are useful for larger items.



**Volumetric Flasks** are used to measure precise volumes of liquid or to make precise dilutions.



**Wash bottles** are used for dispensing small quantities of distilled water.

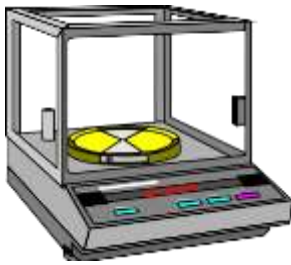


**Watch glasses** are for holding small samples or for covering beakers or evaporating dishes.



**Wire Gauze** on a ring supports beakers to be heated by Bunsen burners

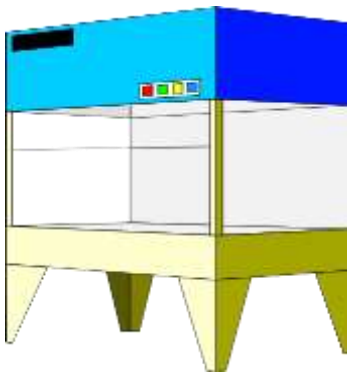




**Balances** are used to determine the mass of a reagent or object.



**Spectrophotometers** are used to measure the absorbance or transmittance of a liquid sample.



**Fume Hoods** are used to ventilate noxious or harmful gases.