

Basic Chemistry Lab Equipment

TC-565

Universidad de Costa Rica

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Contents

1 Glassware

2 Electric equipment

3 Miscellaneous

Beaker (*Beaker*)



- Cylindrical container.
- Used for mixing and pouring liquids, and for performing reactions in aqueous solution.
- Not suitable for measuring small amounts of liquid. They have low accuracy.



Figure: Labelling a beaker.

Glass stirring rod (*Agitador de vidrio*)



- Used for mixing chemicals.

Round-bottom flask (*Balón*)



Figure: Image obtained from:

<https://www.medi-shop.gr/en/volumetric-flasks/round-bottom-flask-200ml>

- It is used as a container and for performing reactions.
- Some of them are volumetric (*balones aforados*). What makes them different is that they are factory calibrated to contain a known amount of liquid. They have an inscribed mark that indicates volume to high accuracy.



Figure: Meniscus over a measuring line.

Porcelain crucible (*Cápsula de porcelana*)



- Used for heating, melting and burning substances.

Porcelain triangle (*Triángulo de porcelana*)



Figure: Image obtained from:

<https://www.macbicnj.com/product/clay-pipe-triangle-2-side-length-uni1-cpt020/>.

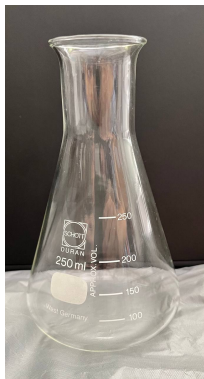
- Used to support a crucible being heated by a heat source.
- It may be used to support a separation funnel.
- It usually is mounted on an iron ring or a tripod.

Separation funnel (*Embudo de separación*)



- Used to separate immiscible liquids.

Erlenmeyer (*Erlenmeyer*)



- Used to contain substances and for carrying out reactions.
- It is easy to mix substances contained inside an Erlenmeyer flask.

Mortar (*Mortero*)



- A pestle is used to crush solid chemicals into smaller pieces, inside a mortar.

Volumetric pipette (*Pipeta volumétrica*)



- Used for measuring small amounts of liquid.
- They measure a fixed volume of liquid (with a mark they have).
- They have high accuracy.

Graduated pipette (*Pipeta graduada*)



- Used for measuring small volumes of liquids.
- They can measure different volumes.
- They have high accuracy.

Pasteur pipette (*Pipeta Pasteur*)



- It is a dropper used to transfer small volumes of liquid.

Burette (*Bureta*)

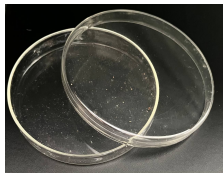


- Used for measuring volumes of liquids, titration or volumetric analysis.
- They can measure different volumes.
- They have high accuracy.
- In contrast to pipettes, burettes are not designed for handheld use.
- They have a stopcock that allows pouring liquid in a controlled way.

Figure: Image obtained from:

<https://www.seal-analytical.com/Product/burette-ptfe-key-stopcock-borosilicate-glass-class-b>.

Petri dish (*Plato petri*)



- Used to cultivate microorganisms or to store chemicals.

Measuring cylinder (*Probeta*)



- Used for measuring volumes.
- It is more accurate than a beaker, but it still has a high error.

Thermometer (*Termómetro*)



- Used to measure temperature.
- There are two main variants, the ones that use mercury (silver colored) or those that use alcohol (red colored).

Test tube (*Tubo de ensayo*)



- Cylindrical container.
- Used for holding, heating and mixing small amounts of liquid and solid chemicals. They can also be used to make small reactions.



Figure: Test tube with threaded top.

Vial (*Vial*)



- Used to store small samples.

Glass funnel (*Embudo de vidrio*)



- Used for transferring liquids to containers with small openings.

Figure: Image obtained from:

<https://www.ecovidasolar.es/823-embudo-vidrio-borosilicato.html>.

Watch glass (*Vidrio de reloj*)



- Used to cover containers, evaporating liquids, weighing and transferring solids.

Figure: Image obtained from:

<https://www.instrumentodelaboratorio.info/vidrio-de-reloj/>.

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Balance (*Balanza*)



- Used to measure the mass of substances.
- A kitchen food scale has low precision.
- A precision balance is much more accurate. They tell how much error they have.
- Balances have a maximum for the masses they can measure (one has

to be careful because weighing an object with too much mass can damage the balance).

Balance (*Balanza*)



- There are 2 ways to weigh a substance: directly (just the substance) and indirectly (the substance in a container). The indirect method weighs the container with the substance and the container alone. Then the substance's mass is obtained as the difference of these masses.

Balance (*Balanza*)



- Some balances have a tare button (to weigh indirectly).

Magnetic stirrer and a stir bar (*Mezclador magnético y pastilla magnética*)



- Used to mix substances with a stir bar immerse in a liquid.

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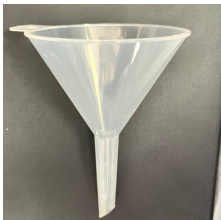
3 Miscellaneous

Magnetic stir bar retriever (*Pescador*)



- Used to extract stir bars after mixing substances with the magnetic stirrer.

Plastic funnel (*Embudo de plástico*)



- Used for transferring liquids to containers with small openings.

Round-bottom flask holder (*Soporte para balón*)



- Used to hold a round-bottom flask.



Figure: Round-bottom flask on its stand.

Clamp (*Pinzas para tubo de ensayo*)



- Used to hold test tubes (especially if they get hot).



Figure: Clamp holding a test tube.

Septum (*Septum*)



- Used to isolate the contents of a test tube from the surrounding atmosphere.

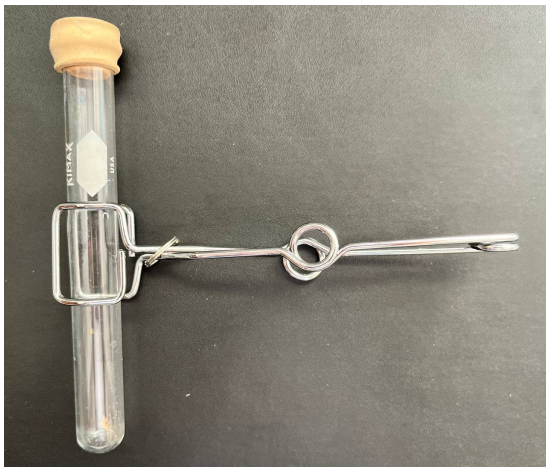


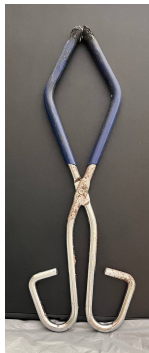
Figure: Clamp holding a test tube with a septum on top.

Tweezers (*Pinzas*)



- Used to manipulate small or delicate objects.

Tongs (*Prensa para cápsula*)



- Used to manipulate (grasping and lifting) porcelain crucibles when they are hot.

Filter paper (*Papel filtro*)



- Used to filter liquids or to hold solid samples for measurement.

Litmus paper (*Papel tornasol*)



- Used to determine if a substance is acid or basic (if the red litmus paper changes color to blue, the substance is basic; if the blue litmus paper changes color to red, the substance is acid).

Universal pH test paper (*Papel pH universal*)



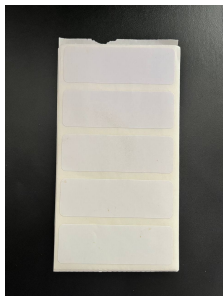
- Used to determine how acid or basic a substance is, in a more precise way (gives a pH number when contrasted with a color scale).

Spatulas (*Espátulas*)



- Used to manipulate solid powdered materials.

Label paper (*Etiquetas adhesivas*)



- Used for labelling containers.

Dropper (*Gotero*)



- Used for transferring and dropping small amounts of liquid.

Test tube rack (*Gradilla para tubos de ensayo*)



- Used to hold upright multiple test tubes.

Pipette bulb (*Pera de succión*)



- Used to suck liquid into a pipette by creating a vacuum.

Figure: Image obtained from:

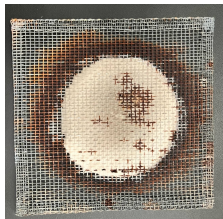
<https://www.drifton.eu/shop/112-pipettes-and-dispensers/2532-pipette-filler-of-rubber/>.

Bunsen burner (*Mechero Bunsen*)

- Used to heat.



Wire gauze (*Cuadro de asbesto*)



- Used to diffuse heat in order to protect glassware which cannot be heated directly.

Universal support (*Soporte universal*)



- Used to securely hold items upright.

Figure: Image obtained from:

<https://www.macbicnj.com/product/support-stand-w-rod-cast-iron-6-x-11-base-with-36-rod->

Universal clamp (*Prensa universal*)



- Used to hold beakers, erlenmeyers, test tubes, ... steadily to the universal support.

Figure: Image obtained from:

https://commons.wikimedia.org/wiki/File:Universal_clamp.jpg.

Burette clamp (*Prensa para bureta*)



- Used to hold a burette steadily to the universal support.

Figure: Image obtained from:

https://en.m.wikipedia.org/wiki/File:Retort_stand_with_a_burette_clamp.jpg.

Ring support (*Anillo de soporte*)



- It is attached to the universal support in order to place a wire gauze, or to support other pieces of equipment.

Figure: Image obtained from:

<https://www.homesciencetools.com/product/ring-support-4-diameter/>.

Muffle furnace (*Estufa de secado*)



- Used to dry and sterilize equipment, and also to heat samples to extremely high temperatures.

Figure: Image obtained from:

<http://www.instrumentosdelaboratorio.net/2012/08/estufa-de-secado-u-horno-de-secado.html>.

THE END