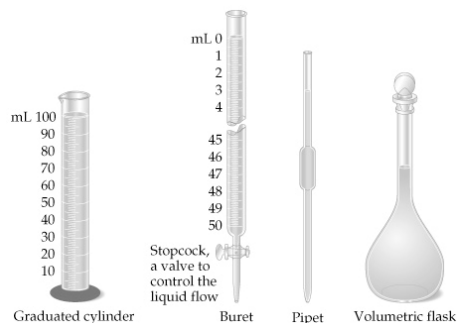


AP lab technique topics:

1. Pipets and laboratory glassware

- Approximate measurement glassware:
 - Erlenmeyer Flask
 - Beaker
- Precise measurement glassware:
 - Graduated Cylinder
 - Volumetric Flask (Good for one precise volume)
 - Pipet (graduated)(May be either precise for one volume or continuously graduated)
 - Buret

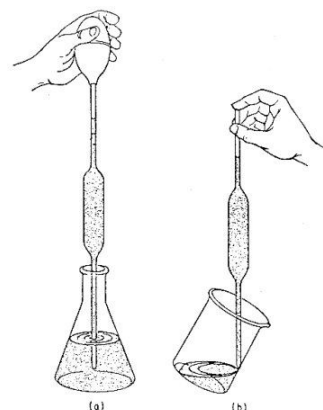


Precise measurement glassware

- Always read to the bottom of the meniscus (bottom of the concave shape of the liquid). Remember that you are always allowed one digit of estimation in a measurement, so if glassware is calibrated in tenths of a mL, you should be able to report to a hundredth of a mL.

- Pipet "bulbs" that are more advanced typically have a rubber bulb or thumb roller that sucks liquid up into the pipet. Once liquid is in the pipet, it can be delivered through a finger controlled button on the side of the pipet bulb.

- When pouring or decanting liquid from a beaker, a glass stirring rod should be used to control the flow of the liquid.



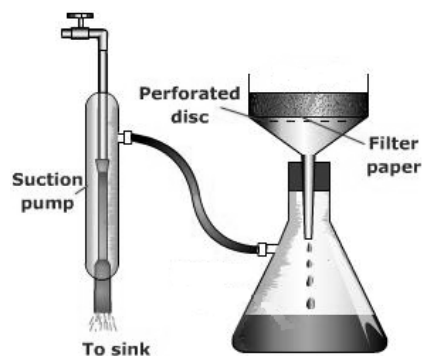
Pipet w/bulb + delivery method

2. Using a Bunsen burner:

- The carburetor on the barrel adjusts the gas/air mixture
 - The flame should be bluish, not yellowish (too little air)
 - You should NOT hear a roaring sound (too much air)
 - The hottest part of the flame is at the tip of the inner cone
- Some Bunsen burners have a gas flow valve as well
- When heating a test tube over a Bunsen burner, always tilt the tube slightly (do not heat straight up and down) and do not point the open end towards anyone
- Boiling "chips" can help control the boiling of a liquid.

3. Working with funnels and filter paper

- There are two main types of funnels:
 - Long stem funnel (for general use)
 - Buchner (BYOOK-ner) funnel for suction filtration (with a sidearm flask)
- Filter paper should be folded into a cone with a general use funnel and typically "wet down" to seal it to the sides of the funnel
- Buchner filter paper is usually a flat disk that sits inside of the upper part of the funnel.



Buchner funnel with side-arm flask.

4. Working with acids and bases

- Always pour concentrated acids (and bases) into water, not the other way around.

5. Working with burets and titrations

- The buret should be thoroughly cleaned and then flushed with water (allowed to run through the system).
- Before use, one or two small portions (aliquots) of the titrant should be allowed to pass through the system (flushing out any water and making sure titrant is in the tip of the buret for consistent delivery)
- Carefully control the flow of the liquid using the stopcock on the buret
- Be sure to include an indicator when necessary.

6. Working with analytical mass balances

- Always use weighing paper or a weighing boat when massing chemicals
- Be sure to "tare" (zero) the balance before making initial measurements
- Most electronic balances should be allowed to "warm up" before use.

7. Inserting glass into stopper holes

- Use glycerin to lubricate the stopper hole
- Do not hold the stopper in the palm of your hand while pushing through the glass tubing (you may jam it through your hand!)

8. Working with the cuvetts on the spectrophotometer.

- Make sure the spectrophotometer is fully warmed up
- Be sure to wipe the cuvet of any greasy fingerprints and align the mark on the tube with the mark on the spectrophotometer

9. Suction (side arm) flask

- Used to remove the liquid from a sample collected on filter paper
- Connects from the glass side arm of the Erlenmeyer flask to the side arm (aspirator) on the faucet. Running water through the faucet creates a partial vacuum that will suck the water out of the filter paper.

10. Pneumatic Trough

- Used as a method of collecting reaction gas through water displacement
- Typically consists of the glass or metal "trough" or bowl with an insert (metallic band with a hole, etc.) for holding a piece of glassware (such as a test tube) inverted with water.
- A rubber tube is passed from a sealed side arm flask up into the inverted tube and as gas is produced in the reaction, the water is displaced from the tube as the gas is collected.

