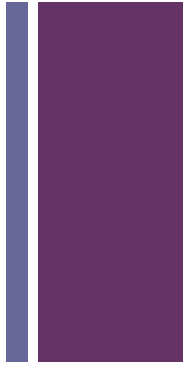


Quantifying Acids



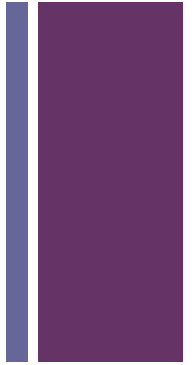
**Qualitative
Analysis**

**Quantitative
Analysis**

+

Titration

- A technique used to determine the concentration of a substance in a solution by adding measured quantities of another substance in a reaction



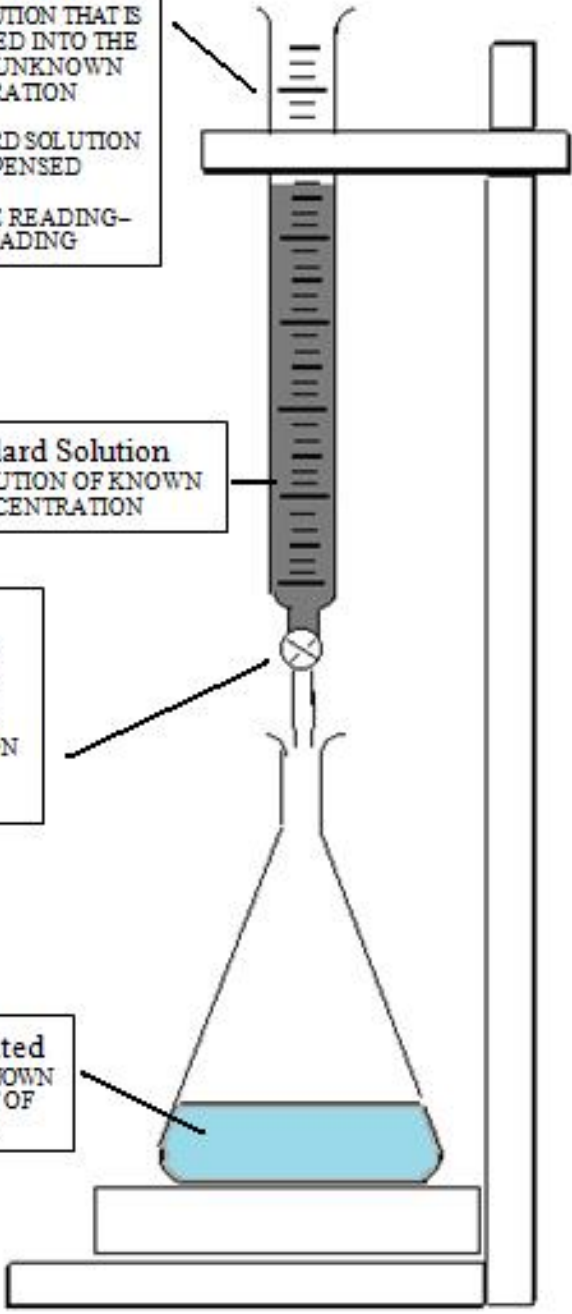
Burette
*USED TO ACCURATELY MEASURE THE AMOUNT OF STANDARD SOLUTION THAT IS BEING DISPENSED INTO THE SOLUTION OF UNKNOWN CONCENTRATION

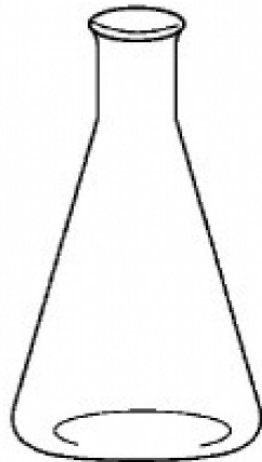
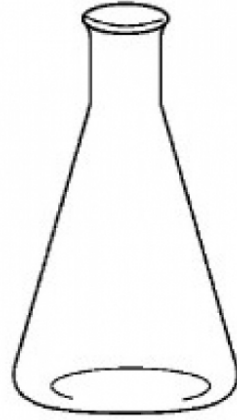
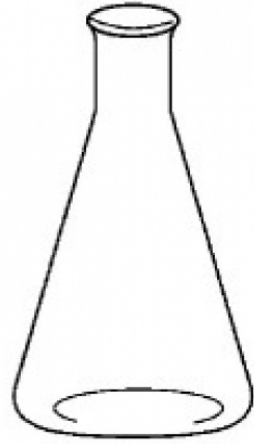
TOTAL STANDARD SOLUTION BEING DISPENSED
=
FINAL BURETTE READING - INITIAL READING

Standard Solution
*THE SOLUTION OF KNOWN CONCENTRATION

Tap
*USED TO ACCURATELY DISPENSE THE CORRECT AMOUNT OF STANDARD SOLUTION IN ORDER TO NEUTRALIZE THE SOLUTION OF UNKNOWN CONCENTRATION

Solution being Titrated
*THE SOLUTION OF UNKNOWN CONCENTRATION, BUT OF KNOWN VOLUME





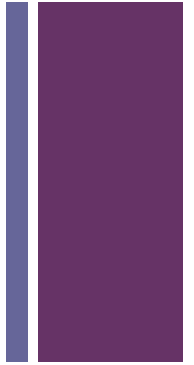
+ Stoichiometry



- Stoichiometry is the process of converting MOLES of one substance to MOLES of another using the mole ratio from the balanced equation

+

Example 1

- The table provided shows data from the titration of four 10.0mL samples of a solution containing hydronium ions and phenolphthalein using 0.130mol/L sodium hydroxide.





	Trial 1	Trial 2	Trial 3	Trial 4
Initial Volume	1.22	13.44	25.35	37.33
Final Volume	13.44	25.35	37.33	49.22
Change in Volume	12.22	11.91	11.98	11.89
Endpoint Color	Dark pink	Light pink	Light pink	Light pink

+

Example 2

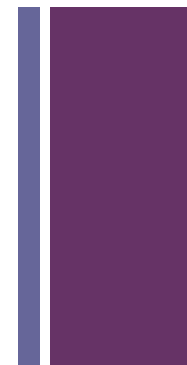
- Consider the reaction between phosphoric acid and potassium hydroxide. If 19.8mL of phosphoric acid with an unknown molarity react with 25.0mL of 0.500M potassium hydroxide, what is the molarity of phosphoric acid?



+

Example 3

- Consider the reaction between acetic acid and calcium hydroxide. What volume of 0.200M calcium hydroxide is required to react with 125mL of 0.250M acetic acid?



+

Example 4

- Consider the reaction between sodium hydroxide and hydrogen chloride. If it requires 4.38mL of 0.1M NaOH to completely neutralize 20.0mL of HCl, what is the concentration of acid in the titration?