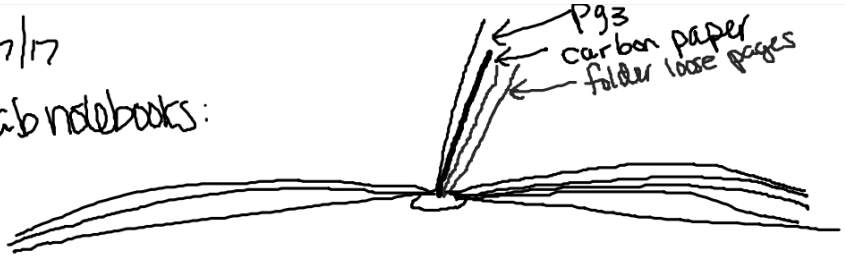
9/27/17

Lab notebooks:



Title: Analysis of Alum pg #

Time frame:

Background:

Materials: Alum

Procedure: (basic idea)

Data Table:

Titrations

Determination of the quantity of an analyte using volume as the signal.

Types of titrations

1. Acid/Base
2. Metal-ligand Complex Formation
3. Redox
4. Precipitation

Titrations work by finding the stoichiometrically equivalent amounts of the analyte and the titrant. (Reagent with a known concentration) You are seeking to find the equivalence point by using a known volume of titrant.

An indicator is used to visualize the end point — color change, precipitate formation, voltage change + absorbance of light.

There is a slight difference between equivalence point + end point, this difference is referred to as determinate error (titration error). Choosing the best indicator (end point) can extremely reduce this error so that it can be ignored.

Conditions required for a titration

1. all reactions of the analyte + titrant are of known stoichiometry.
2. reactions must occur rapidly
3. a suitable method must be available for determining the end point (w/in an acceptable closeness to the equivalence point.)

moles of titrant = V_{eq} × C_T

(V_{eq} = equivalence pt. volume; C_T = titrants concentration)

Back titration A + B → AB — substance A can not be titrated directly

↑ analyte

Procedure: add a known volume of B so that the reaction goes to completion (1 drop more than required for the reaction to happen) – this will form AB. After the reaction has gone to completion determine quantity of B used.

Displacement Titration A + X → AX (not measurable)

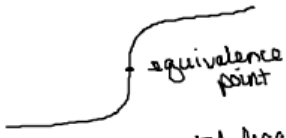
A + BX → AX + B (B can be titrated)

↑ known volume, in excess.

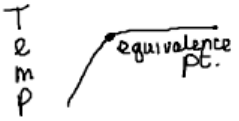
$$\text{Qty given} \times \frac{1\text{ mol given}}{\text{molar mass given}\ \text{-or-}\ 22.4\text{ L given}} \times \frac{\#\text{ mol needed}}{\#\text{ mol given}} \times \frac{22.4\text{ L of needed}\ \text{-or-}\ \text{molar mass of needed}}{1\text{ mol needed}}$$

molar ratio (# are coefficients)

Titration Curve: a graph showing the progress of a titration as a function of the titrant added. The equivalence point is often the point of inflection on the graph.



(Acid/Base, metal-ligand complexation, redox + precipitation)



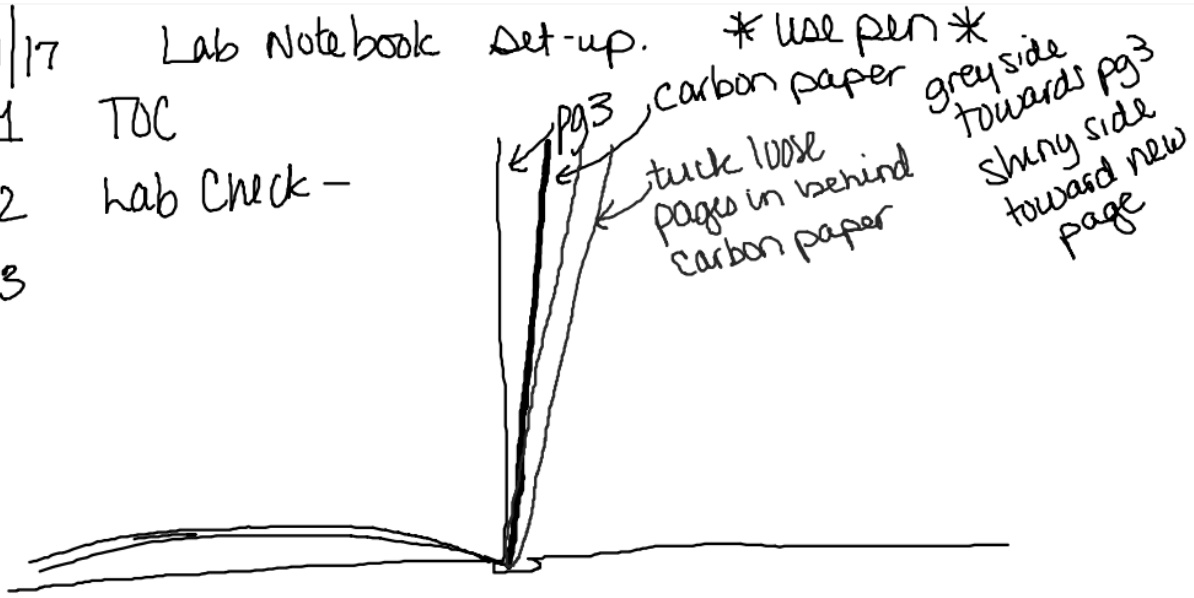
thermometric titration

9/27/17 Lab Notebook Set-up. * use pen *

pg 1 TOC

pg 2 Lab Check –

pg 3



Title: Analysis of Alum pg 3

Timeframe:

Background/Purpose: Yada yada

Materials: Alum, ringstand,

Procedure: (overview)

Data Tables:

Titrations

Titrations - used to determine the quantity of an analyte using volume as a signal.

Types:

1. Acid/Base
2. Metal-ligand complex formation
3. Redox
4. Precipitation

Titrations work by finding the stoichiometrically equivalent amounts of the analyte and the titrant. (the reagent used for titration that is a known concentration)

You are seeking to find the equivalence point by using a known volume of titrant.

Equivalence point = when the amount of titrant is the exact amount required for a stoichiometric reaction w/ the analyte.