**Neutralization Reactions**

When a \_\_\_\_\_\_\_\_\_\_\_\_ acid and a \_\_\_\_\_\_\_\_\_\_ base solution are mixed, a \_\_\_\_\_\_\_\_\_\_ reaction occurs, and the products do not have the characteristics of either acids or bases. Instead a neutral \_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ are formed. The generic formula for this reaction is \_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_ + H2O.

Practice:

Potassium hydroxide is mixed with carbonic acid

Iron (III) hydroxide and phosphoric acid

**Titration**

An acid-base \_\_\_\_\_\_\_\_\_\_ is when you add an \_\_\_\_\_\_\_\_\_\_\_ to a \_\_\_\_\_\_\_\_\_\_\_\_ until the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ is reached which is where the number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ equals the number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. For the titration of a strong base and a strong acid, the equivalence point is reached when the pH of the solution is \_\_\_\_\_\_\_\_\_. An \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is used as a method that relies on observing a color change in the solution. The point at which the indicator changes color is called the \_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_.

Follow these steps to complete calculations for titrations:

1. Write and balance the neutralization equation
2. Use molarity equation to determine moles of known (acid or base)
3. Mole ratio
4. Use molarity equation to solve for concentration (or volume) of unknown (acid or base)

Practice:

1. By titration, 17ml of H2SO4 neutralized 27ml of 0.0165M LiOH solution. What was the molarity of the acid?

2. 100. ml of 0.25M hydrochloric acid solution is used to neutralize 500. ml of a base with an unknown concentration. What is the concentration of the base?