**Acids and Bases Homework #6**

**Part I: conceptual**

1. Explain what is meant by the term “equivalence point” as it relates to a titration between a acid and a base.
2. What is an “indicator” and what is its purpose in the titration between an acid and base.
3. Show at the particulate level the four stages of a titration of a strong acid with a strong base along with pH (pH<7, pH = 7, pH>7)

Stage I: just strong acid

Stage II: addition of small amount of strong base

Stage III: at the equivalence point

Stage IV: additional of enough base to go past the equivalence point

Sketch a properly labeled titration graph of this titration.

We’ve focused conceptually on the titration of a strong acid and base. However the math works the same no matter what type of titration.

**Part II: math**

For each scenario:

* Write a balanced chemical equation
* State the equivalent mole ratio of acid to base according to the balanced chemical equation
* calculate the concentration or volume of the unknown asked for in each problem
1. Sue is titrates 25 mL 0.02M hydrochloric acid with 15 mL of an unknown concentration of sodium hydroxide. Determine the concentration.
2. John titrates 20 mL of 2.3 x 10-3 M barium hydroxide with 24.5 mL of an unknown concentration of nitric acid. Determine the concentration
3. What volume of 1.5 M potassium hydroxide will be neutralized by 17.5 mL of 1.85M sulfuric acid?
4. 20.0 mL of 2.3 M phosphoric acid reaches the equivalence with what 18 mL of what concentration of barium hydroxide