**Weak Acid, Strong Base Titration Lab**

Purpose to illustrate the equivalence point and end point of a BrØnsted Lowry reaction using both indicators and pH probe

Materials Weak acid (unknown concentration) Acetic Acid

Strong base (1.0 ) Barium hydroxide

Burettes

Pipettes

Beakers, stir rods, Erlynmeyer flasks

Prelab:

1. Use Ba(OH)2(s). Calculate the mass of strong base necessary to make 100 mL of 1.00  hydroxide solution. Be sure to write a dissociation reaction or you will be tricked!!
2. Write the BrØnsted Lowry reaction for the titration of a 10.0 mL sample of CH3COOH(aq) with sufficient Ba(OH)2(aq). Label the base, acid, conjugate acid and conjugate base.

* . The base used in this lab is (monobasic, dibasic, polybasic) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* The acid used in this lab is (monoprotic, diprotic, polyprotic) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* The expected graph will start at a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ number. The graph will have (one, two, three) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bump(s), and will end at a \_\_\_\_\_\_\_\_\_\_ number.

1. Choose an indicator you wish to use for this lab \_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Give the color before \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and after \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the equivalence point.
3. Predict the volume of base that will bring you to the equivalence point of the reaction. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mL
4. What will the expected pH be at the equivalence point? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Justify your answer
5. When the base becomes the excess reagent, what new colour will you see? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Procedure:

1. Using correct procedure, make 100 mL of 1.0 Ba(OH)2(aq) solution.
2. Using correct rinsing procedure, pipette 10 mL the unknown acid into the flask
3. Add the appropriate indicator. Record the color \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Rinse and fill the burette with the base.
5. Slowly titrate the acid solution until the end point is reached. Record the color. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Keep this sample as a reference point and repeat the steps again.
7. During a minimum of one trial, use the pH probe and record the pH after each addition of titrant. (Take the solution past the equivalence point to see how the pH scale reacts to the excess reagent)
8. Using a pH probe take the pH of a sample of the unknown acid. Record. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Observations:

Make tables to hold all the required observations.

Analysis:

1. Use the information gathered in the lab to calculate the concentration of the acid.
2. Using the concentration of the acid, calculate the pH of the acid. Compare this to the pH measured using the pH probe. Account for any similarities or differences in the two values. Remember that CH3COOH is a weak acid. You will need to use the Ka for the acid.
3. Plot a titration curve using the observations made with the pH probe. Mark the equivalence point. Compare this value to your prediction in the prelab. Do they agree? Why or why not?