**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Titration Curve Lab**

Guiding Question: What is the identity of an unknown solid acid?

Background Information: Acids can be identified using their molar mass and equilibrium constants. Citric acid is commonly found in sports drinks while benzoic acid can be used to aid acne. Which acid are you titrating?

Procedure:

1. Rinse a 50.00mL burette, first with distilled water, then with the NaOH solution. Record the concentration of the NaOH from the first lab in your data.
2. Mass 0.4 - 0.5g of the unknown solid acid and add to a beaker.
3. Add about 125mL of distilled water. (Why does the exact amount of water not matter?)
4. Standardize the pH meter as instructed by your teacher.

 **The slope should be -3.838 and the y-intercept should be 13.72.**

1. Titrate the NaOH into the weak acid solution, going by 0.50mL increments until a complete S curve is graphed on the calculator. You must press ENTER and the **TOTAL** number of milliliters of NaOH added and then ENTER again each time on the calculator so it will graph the curve for you.
2. Decide where the end point occurred and record the volume added and pH.
3. Decide where halfway to the endpoint occurred (half the volume) and record the volume and pH.

Data: Record all data with specific labels and units.

Data Analysis:

1. Sketch the graph off of the calculator, specifically showing initial and final conditions, the equivalence point and the half titration point.
2. From the mass of the unknown solid sample and the volume and concentration of the base added, determine the molar mass of your unknown solid.
3. Determine the pKa and the Ka of your weak acid.

Claim: Which acid do you have?

Evidence: How do you know? What is your interpretation of the relevant data?

Justification: Prove with a calculation of the percent error of the molar masses of your unknown versus the published value. 