



Aspirin Titration



Introduction:

Aspirin is an acid. The active ingredient is acetyl salicylic acid. Different strengths of aspirin are based on the amount of active ingredients that they contain. Titration is a way to determine how much acid is in a solution by adding just enough base of a known concentration to neutralize the acid. In a neutralization, the number of moles of acid, H^+ , are combined with an equal number of moles of base, OH^- . In the titration you will be performing, you will dispense base into a known amount of acid solution to find the unknown concentration. If you wanted to know the concentration of an unknown base, you could titrate the base with an acid in the same manner. The aspirin will be titrated against a standard solution of base, 0.100 M NaOH. Base will be dispensed from a buret into a beaker containing the dissolved (in ethanol) acid and phenolphthalein indicator, which will show a faint pink color in basic solutions. In addition to the base indicator, an electronic pH meter will be used to keep track of the exact pH of the solution and the progress of the titration. You and your lab partner(s) will do 3 titrations to study children's aspirin, regular aspirin and extra-strength aspirin.

Purpose:

In this experiment you will run a titration to determine the amount of aspirin (acetyl salicylic acid) present in an aspirin tablet. You will share data with other groups to make a comparison between generic children's aspirin, generic aspirin, and Bayer aspirin.

Materials:

0.100 M NaOH	Buret
Ethyl alcohol	Mortar and pestle
Various strengths of aspirin	Phenolphthalein indicator
250 mL beaker	Goggles

Procedure:

1. Find the mass of a children's aspirin, regular aspirin and extra-strength aspirin tablet. Grind each tablet into a fine powder by using a mortar and pestle.
2. Tare a piece of weighing paper or a weighing dish on the balance. Carefully transfer as much powdered sample to the paper or the dish and then determine the mass.
3. Place the powdered sample into the beaker.
4. Add 25.0mL of water to the beaker. Put a magnetic stir bar in your beaker and place the beaker on the center of the stir plate.

5. Add a 10.0 mL portion of ethyl alcohol to the beaker and begin to stir.
6. Put 3 drops of the phenolphthalein indicator into your beaker.
7. The buret is filled with 0.100M NaOH. Make sure there are no bubbles apparent in the buret. Record the initial volume on the buret.
8. Clamp the pH probe and lower it into the solution making sure the stir bar is not hitting the probe as it turns.
9. If not done so already, prepare the computer for data collection by opening "EXP24" from the Chemistry with Computers experiment files of Logger Pro. (Choose Programs, Vernier, Logger Pro, Chemistry with Computers, Experiment 24)
10. Before adding NaOH titrant, click on the Collect button and monitor pH for 5-10 seconds. Once the pH has stabilized, click on the Keep button. The computer will hold this pH value, and wait for you to type in a buret reading. In the Volume edit box, enter the current buret reading (0 mL). Click on the OK button. You have now saved the first data pair for this experiment.
11. Begin titrating. Add the NaOH in approximately 1.0 mL increments, recording the new total added volume each time you click the "keep" button. Remember to make note of when the color change occurs. Continue adding base 5.0 mL past the equivalence point (the equivalence is approximately when the solution turned pink from the phenolphthalein). Save the graph so you can put all three graphs on one page and print at the end of the experiment.
12. Repeat steps 1-11 for the remaining tablets.
13. Clean lab equipment with water, and wipe the lab surface with a wet paper towel. The pH probe should be rinsed with distilled water and put back into its storage solution.