

Experiment: Standardizing a Base (Formal Lab Report)

Purpose: To find the molarity of a base.

Procedure:

1. Weigh out approximately 1 gram of oxalic acid, $\text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$. Record the exact mass of the oxalic acid. **(Oxalic acid is poisonous. Do not touch it or get any into your mouth. Wash your hands before leaving the lab.)**
2. Put the acid into an Erlenmeyer flask, and add about 10 mL of water. The amount of water is not important.
3. Choose, and add an indicator to the Erlenmeyer flask. Use bromothymol blue or phenolphthalein as indicator
4. Put the unknown molarity NaOH solution into the buret, and record the initial volume.
5. Titrate the acid to the endpoint. Video the process and edit video to 30 seconds to 1 min.
6. Calculate the molarity of the base.
7. **Formal Lab Report: Be organized and label work.**

Formal Lab Report**Experiment: Acetic Acid in Vinegar**

Purpose: To determine the percent by mass of acetic acid ($\text{HC}_2\text{H}_3\text{O}_2$) in two different brands of vinegar. Each partner must do a different brand. Your conclusion should compare the percentage.

Procedure:

- 1, Weigh out some vinegar in an Erlenmeyer flask.
2. Choose, and add an indicator to the vinegar.
3. Titrate with the NaOH solution that you standardized in the previous experiment.
4. Repeat with two other brands of vinegar.
5. Find the percent by mass of acetic acid ($\text{HC}_2\text{H}_3\text{O}_2$) in each brand of vinegar.
6. Find the actual percent on the bottles and determine percent error for each.

Formal Lab Report**Experiment Percent NH₄OH in Household Ammonia Solutions**

Purpose: To find out the percent by mass ammonia in commercially sold ammonia solutions.

Procedure: Remember that ammonia (NH₃) changes to ammonium hydroxide in water (NH₄OH)

Each partner must do a different brand. Your conclusion should compare the percentage.

1. Weigh out some household ammonia solution.
2. Titrate the ammonia solution with 0.50M HCl.
3. Repeat the procedure using a different brand of ammonia.
4. Calculate the percent by mass NH₄OH in the ammonia solutions.

Acid/Base Titration of an Eggshell You can use the logger pro for this titration or you can use the buret and indicator.

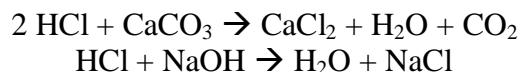
INTRODUCTION:

During the 1960's and 70's the United States used a pesticide called DDT extensively. Unfortunately, the run-off from this pesticide entered our waterways and eventually into many of our wild bird life. DDT affected the population by weakening the eggshells which would break before hatching. An example of this devastation was the American Bald Eagle whose population was as low as 400 mating pairs in the lower 48 states.

The pesticide has been banned in the United States and the Bald Eagle is no longer on the endangered species list. One method of monitoring the strength of the egg is by determining the percent calcium carbonate in the eggshell. This can be accomplished through an acid/base titration method.

PROCEDURE:**Acid Base Titration of an Eggshell**

Weigh out 0.2 grams of the eggshell (found in small square bottle) and place it into a clean dry 250 ml beaker. Get every molecule possible from the weighing paper. Pipet (Use a buret) 50 ml of HCl and add this to the beaker. Stir for 5 minutes. Titrate this mixture with the 1 M NaOH. Determine the number of moles of HCl left in solution. Determine the moles of Calcium Carbonate in the mixture. Determine the percent calcium carbonate in the entire eggshell. The reactions taking place are:



When you have finished collecting data, click . Dispose of the reaction mixture as directed. Rinse the pH Sensor with distilled water in preparation for the second titration. You will need find—the # of moles of HCl in the titration, Number of mole of HCl you started with, and the grams of CaCO₃ reacted with the HCl.

Write a formal lab report

Unknown: each partner will receive an unknown molarity sample of either NaOH or HCl from me. You will determine the molarity of your sample. If you have HCl, use your standardized base to titrate. If you have NaOH, use oxalic acid to titrate. Just turn in your calculations and answer. Handwritten