Name: **Period:** **Date:**

Aspirin Titration

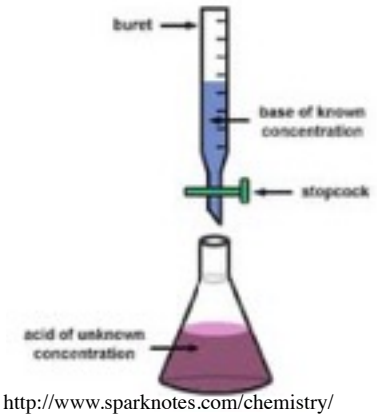
Objectives

- Calculate the number of moles of aspirin in each of the tablets
- Calculate the number of moles of NaOH needed to titrate the aspirin
- Calculate the volume of 0.10M NaOH required to titrate the aspirin
- Complete titrations of each aspirin to find the experimental value
- Compare the predicted amount NaOH with the amount used experimentally

Scenario

The active ingredient in aspirin 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. At the point of neutralization, the number of moles of acid (H+) is combined with an equal number of moles of base (OH-).

You will perform a titration by dispensing a base of known volume and concentration into an acid solution of known volume but an unknown concentration. The aspirin will be titrated against a standard solution of base, 0.100 M NaOH. This base will be dispensed from a burette into a beaker or flask containing the dissolved (in ethanol) acetyl salicylic acid and phenolphthalein indicator, which appears as a faint pink color in basic solutions



http://www.sparknotes.com/chemistry/acidsbases/titrations/section1.html

In this lab you will be given two types of aspirin, low dose aspirin containing 81mg of aspirin and regular strength aspirin containing 325mg of aspirin.

First you will calculate the amount of NaOH you will need in order to do the titration, then you will proceed with the titration and find your error.

Materials

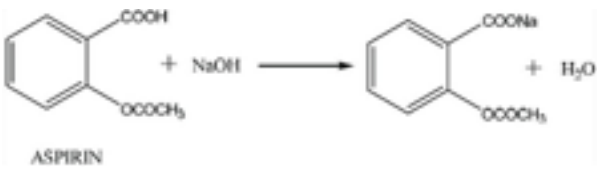
- 1 low dose aspirin
- 1 regular strength aspirin
- Mortar & Pestle
- 2 Pipettes
- 1 burette
- Ring stand and burette clamp
- 60mL of 0.10M NaOH
- Phenylthalein
- 125mL Erlenmeyer flask
- DI water
- Isopropyl Alcohol
- 25mL or 50mL graduated cylinder

Predictions

We are going to begin by calculating the volume of NaOH which we expect to use. The way we predict the amount of reactants needed is through stoichiometry.

First take a look at the reaction:

$HC_9H_7O_4 + NaOH \rightarrow NaC_9H_7O_4 + H_2O$



This is considered a *neutralization reaction*, because an acid (aspirin) and a base (NaOH) react to form a salt and water. If you look at the reaction you can see that this is balanced already with all coefficients of 1.

Your goal is to calculate the number of moles of NaOH needed to neutralize each type of acid. Then you will determine how much of the 0.10M solution will be needed.

Calculate the molar mass of aspirin (Aspirin: $HC_9H_7O_4$)	Answer
Work:	

Prediction: Low Dose Aspirin	Show Work	Answer
Number of mg in one tablet	Given	81mg Low Dose Aspirin
Number of grams in one tablet		
Convert the grams into moles of aspirin using the molar mass		
Using your mole to mole ratio, determine the moles of NaOH required to neutralize this sample of aspirin		

If you have a 0.10M solution of NaOH what is the volume of NaOH you will need in L and mL? (M=moles/L)		*predicted volume to be used in error calculation

Prediction: Regular Strength Aspirin	Work	Answer
Number of mg in one tablet	Given	325mg Regular Strength Aspirin
Number of grams in one tablet		
Convert the grams into moles of aspirin using the molar mass		
Using your mole ratio, determine the moles of NaOH required to neutralize this sample of aspirin		
If you have a 0.10M solution of NaOH what is the volume of NaOH you will need in L and mL? (M=moles/L)		*predicted volume to be used in error calculation

Data Table

Prepare you data tables before we go to the lab…

Trial 1: Low Dose Aspirin	
Initial Volume NaOH	
Final Volume NaOH	
Volume of NaOH used	

Trial 2: Regular Strength Aspirin	
Initial Volume NaOH	
Final Volume NaOH	
Volume of NaOH used	