

CHM 115 Lab 4

Titration 2: Determination of %KHP Mass in an Impure Sample

Purpose: Using the NaOH you standardized, you will determine how much KHP is in an impure sample.

Background: You will repeat exactly the same reaction, the neutralization of an acid (potassium hydrogen phthalate KHP) with a base (NaOH). This time NaOH will be your titrant, because you know its exact concentration. The KHP will be the analyte because it is impure, so the amount you actually have is unknown.

Procedure (This is the part you have to write in your notebook):

Locate your brown bottle with the standardized NaOH. It should be mostly full (~ 800 mL). You will be working alone for this lab.

1. Obtain a numbered mixture containing an unknown amount of KHP from the desiccator. Record the unknown number. Rinse out the buret with your standard NaOH solution and set it up for titrating.
2. Weigh to four places past the decimal *one sample* of about a gram; dissolve it in about 75 mL of deionized water; add 3 drops phenolphthalein indicator and titrate to the endpoint with your NaOH solution.
3. For best results, a titration should require 20-40 mL of titrant. If your mixture has very little KHP in it, you may need to use up to 2.0 g of sample, so that more titrant will be required. Do not use more than 2.0 g or we will run out. Do at least three titrations with the same size sample.
4. Calculate how many moles of KHP are present in your sample. Remember you cannot use the molar mass because it is a mixture, not pure KHP. So you'll need to use the concentration of your NaOH that you measured last week to do this calculation. Then find the grams of KHP in each run. Divide the g KHP by the mass of the mixture to find the percent KHP for each run. Find the average % KHP, deviation and average deviation. If your deviation is more than 0.5%, perform more titrations.
5. When you are finished remember to rinse the buret thoroughly with water, loosen the stopcock and return the buret to the rack. Dispose of the remaining NaOH solution, rinse the brown bottle and leave it on the shelf.

	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Mass impure KHP					
Initial buret vol					
Final buret vol					

Tips:

- Do not throw the data out if you overshoot. One extra drop can cause a huge change in color but a pretty small effect on concentration. Just record it as an observation.
- Use the deionized water squirt bottle to rinse down the sides of your flask if anything splashes.
- Do the first run quickly to get a good idea of where the endpoint will be. Then use very similar masses of KHP for the subsequent runs, so you'll know exactly when to slow down.
- If the volume required to titrate 1 g of KHP is not in the range of 20-50 mL of NaOH, your solution was made wrong (you probably used KOH or measured volume incorrectly). Talk to your instructor.
- Watch significant figures. Rounding errors can affect your precision.
- If you've added more base than should be required and there's still no hint of pink, make sure you didn't forget the phenolphthalein indicator.
- If you're not sure if something is pink, compare it to a white sheet of paper near natural light.