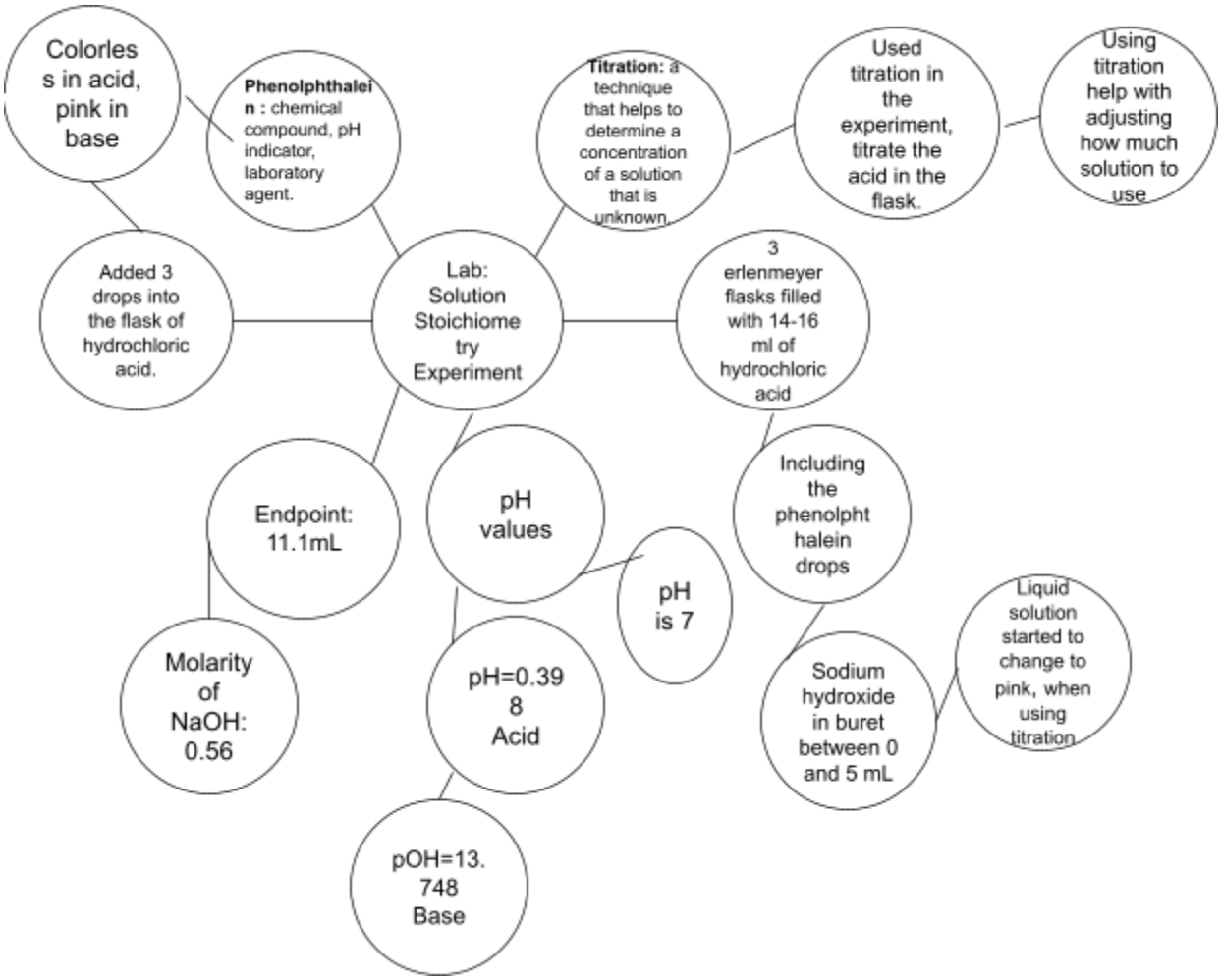
Course:__CHM130AA_____

Before you begin, Go to File → **Make a Copy** and Save in your personal Google Drive

Brainstorm what you experienced in the lab to select a Main Claim:

Bubble Map

***Double click* on the map below and fill in experiences/observations from the lab**



Pick one bubble to focus on for this lab write-up

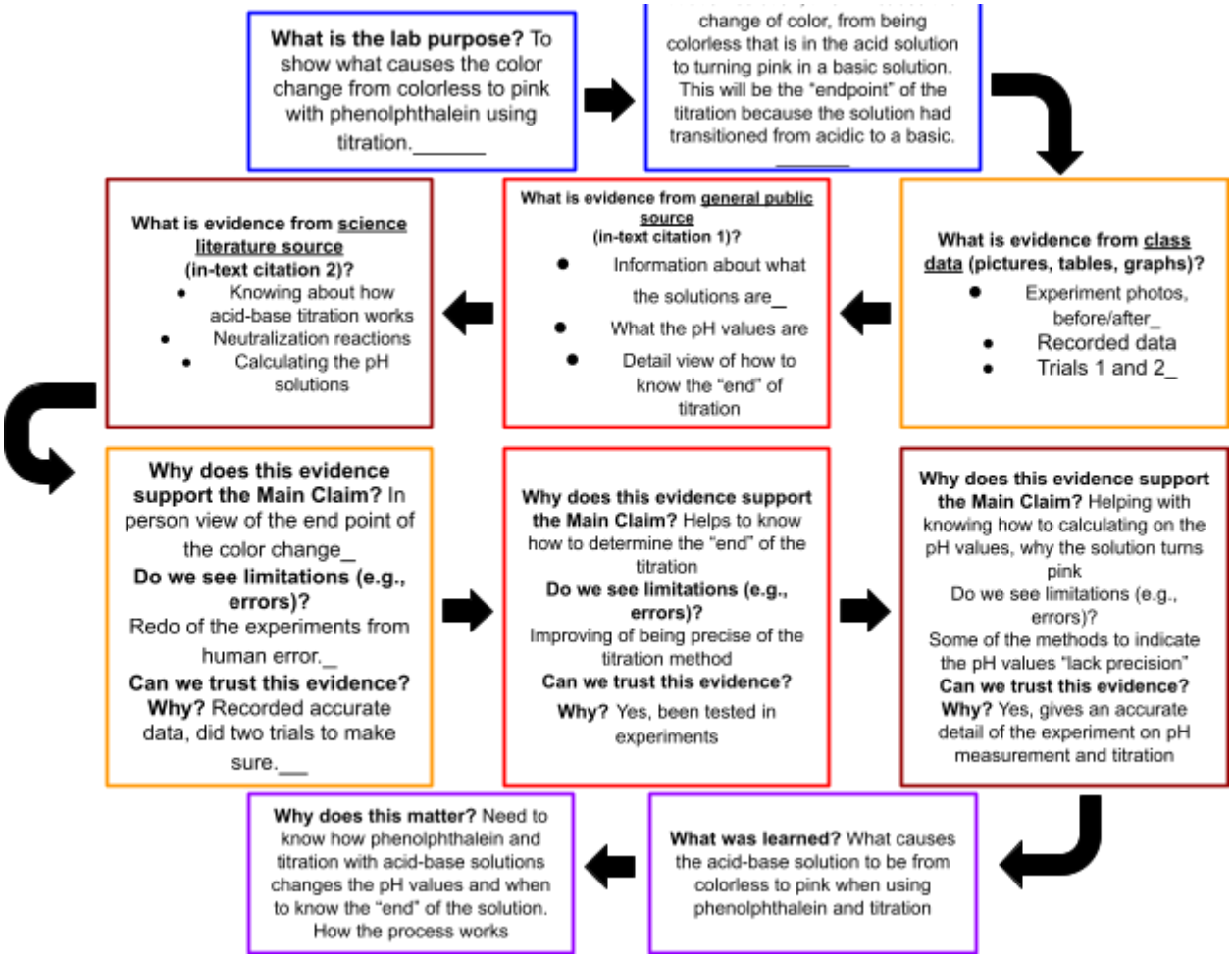
Main Claim: __When phenolphthalein is in an acid- base titration solution, this will cause the change of color, from being colorless that is in the acid solution to turning pink in a basic solution. This will be the “end” of the titration because the solution had transitioned from acidic to a basic.

_____

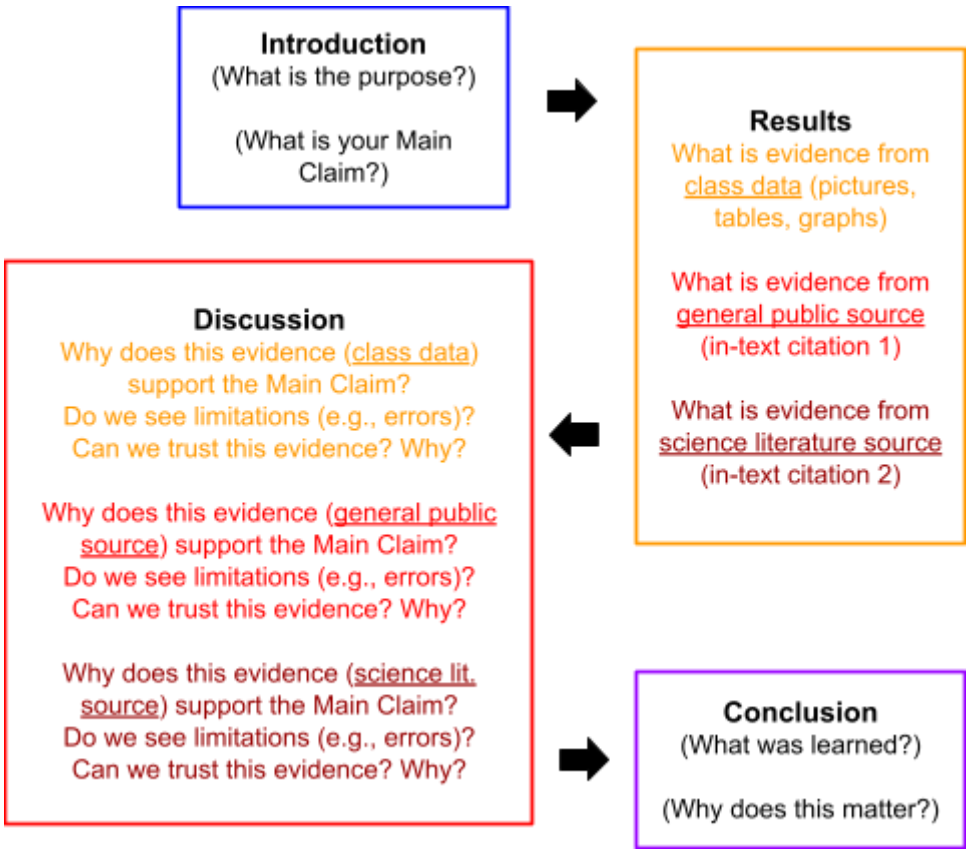
Develop an outline for your Lab Write-up:

Flow Map Outline

***Double click* on the map below and fill in *briefly* based on your lab experience**



Lab Write-Up Format
(for reference ONLY)

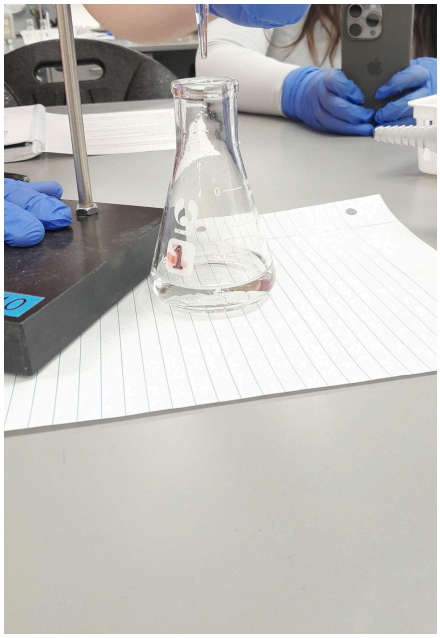


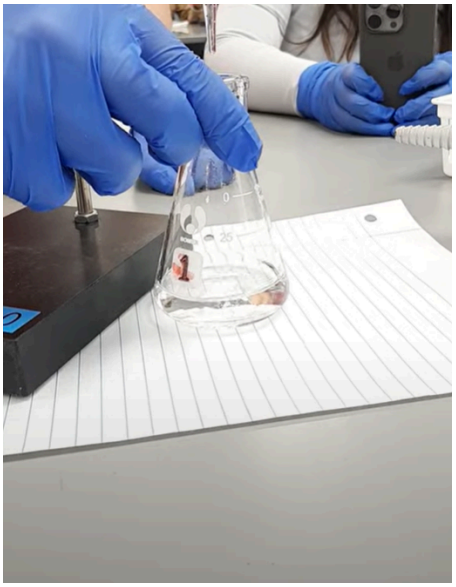
Lab Write-Up
***Copy* your outline information above and then elaborate in sentence-form**

Introduction

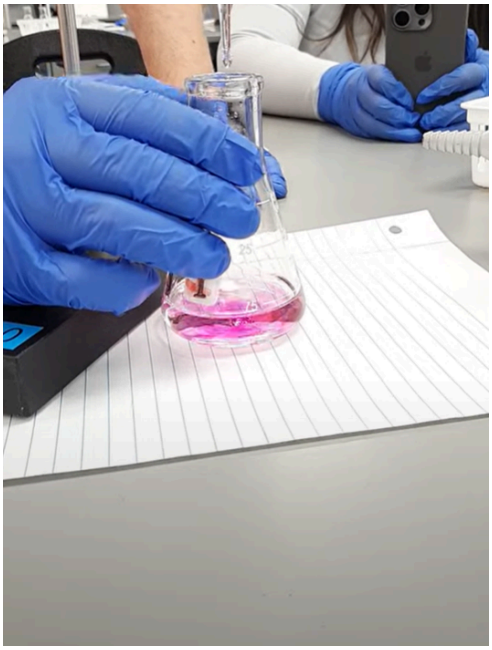
The purpose of the research paper is to discuss and show about what causes the color change when phenolphthalein is added to hydrochloric acid and sodium hydroxide, while using the titration method. Therefore, when phenolphthalein is in an acid- base titration solution, this will cause the change of color, from being colorless that is in the acid solution to turning pink in a basic solution. This will be the “end” of the titration because the solution had transitioned from acidic to a basic. Recorded data with the molarity of the solution helped to determine the concentration of the pH values from the experiment.

Results

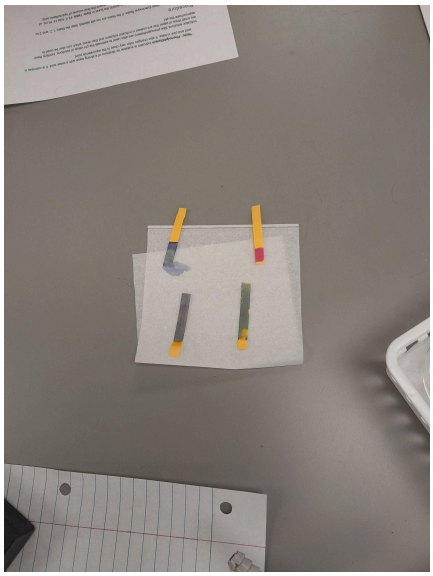


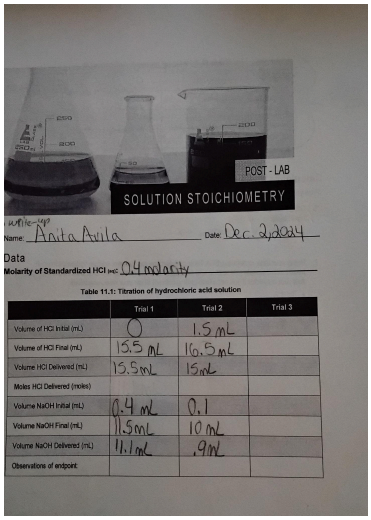
The photos are the start of the experiment process. Waited for the solution to get really pink before mixing the solution. I noticed that the color faded away while mixing the solution.

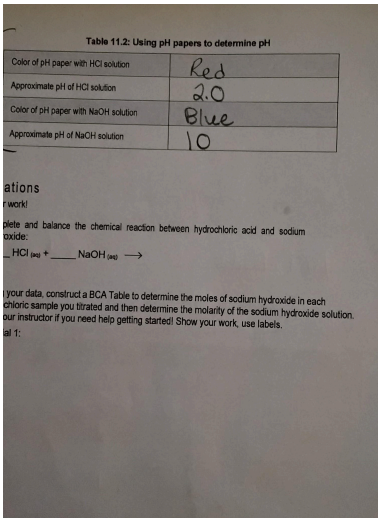



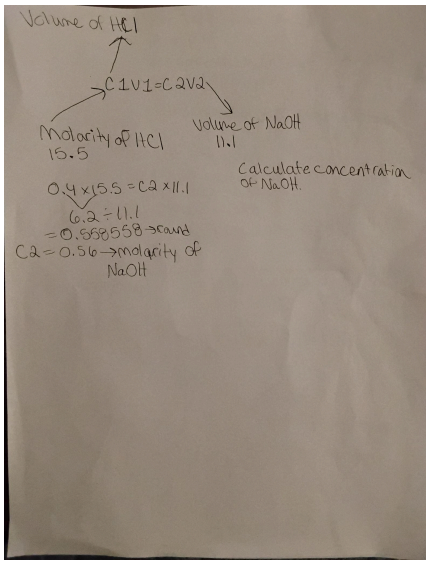
This is the process of adding a drop at a time while stirring the solution. Left of the photo is when the “endpoint” was reached.

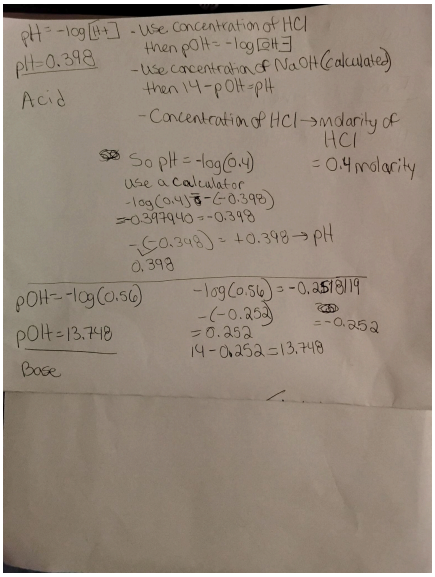


pH paper results.









Discussion

Phenolphthalein is a compound that is colorless, which is use to be as an indicator when it is in an acid-base titration in chemical experiments (Phenolphthalein, 2024). Titration is a technique used in chemical experiments that helps to determine what type of concentration is in an unknown sample. Think of titration as a way of finding the measurement of the concentration from a chemical sample, in knowing the amount of another chemical that was “used up” first (Titration, 2024). With hydrochloric acid and sodium dioxide, in an experiment with using phenolphthalein in addition to titration, you will find that there is a color change to the solution. When phenolphthalein is added to an acid-base titration, the solution will first start out being colorless to turn pink. Another way to understand this transition from being colorless to turning pink is, that in acid solution it is colorless and in basic solution, changes to a pink color. In

addition to this, the pink color will indicate that there is an “end” to the solution (Jennings, 2010).

In the stoichiometry lab experiment, there was a human error that had occurred during the experiment. The human error was that the process of the titration was not done correctly for trial one. This caused the calculations of trial one to be inaccurate and can cause the pH values to be inaccurate as well. Therefore, the experiment had to be redone. With this in mind, I was able to find accurate results and the results revealed the “end” of the titration process as well. From the lessons that were taught in class, when there is an acidic solution, the phenolphthalein will be colorless because the pH is less than seven. In order to find the pH values I firsted needed to know the molarity of the solution and then convert the molarity to the hydrogen ions or OH ions that are in the solution. Since I have the molarity of the solution which is for HCI of 0.4, I must use this to be able to convert this to the molarity of hydrogen ions to find the pH value of the acid, 0.398.

To find the pOH value for the base, you must take the volume of HCI delivered (mL) of 15.5 from trial one and the volume of NaOH delivered (mL) 11.1, to calculate the concentration of NaOH. After calculating, the molarity of NaOH the results was 0.56. The next step is to convert this to the molarity of OH ions and discover the pOH of the base is, 13.748. Also, pH and pOH do not have any units and need to be between zero and fourteen. As a result, I was able to conclude that sodium hydroxide is a very strong basic base. This is what causes the solution from being colorless to turning pink, which indicates the “end” of the titration has been reached, which is 11.1 mL.

Conclusion

In conclusion, with the stoichiometry in-lab experiment, knowing the “end” of the phenolphthalein with titration in an acid-base solution, is when the solution goes from starting out as being colorless to turning pink. Knowing how phenolphthalein with titration in an acid-base solution works is important because this will help you to determine the concentration measurement of an unknown solution by accurately measuring the volume of a solution that is already known. This is done by needing to know the “end” of the titration method from the chemical reaction when it has been concluded. Also, finding the molarity and the pH values of the experiment, help the researcher to have more accurate measurements of the acid and base that are in a solution during the experiment.

References

“Phenolphthalein.” *Wikipedia*, Wikimedia Foundation, 23 Nov. 2024, en.wikipedia.org/wiki/Phenolphthalein#:~:text=Phenolphthalein%20is%20often%20used%20as,dyes%20known%20as%20phthalein%20dyes.

"Titration." *Wikipedia*, Wikimedia Foundation, 24 Oct. 2024, en.wikipedia.org/wiki/Titration.

"Stoichiometry." *Wikipedia*, Wikimedia Foundation, 9 Dec. 2024, en.wikipedia.org/wiki/Stoichiometry.

Jennings, P. A., Mullen, C. A., & Roy, M. (2010). Titration and pH Measurement. *ELS, December*.