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CHEM 1111

Lab 4 Reflection

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Lab four consisted of two key concepts. The first one revolved around pipets and burettes are different types of glassware to measure the precise volumes of different liquids. Volumetric pipets primarily consist of one measurement line and deliver the precise amount labeled on the pipet. There are also certain procedures that must be followed in order to correctly deduce the volume. This regards the overall idea involving the meniscus as the user's eye level must be parallel to it. A burette is used to deliver known volumes of liquid. A significant detail of a burette is that its tip must be completely filled with liquid before the volume is measured.

Throughout the different phases of this lab section, I took different measurements to calculate the mass, volume, and density of a sugar solution. During phase 2, I used the Erlenmeyer flask to calculate the overall mass of the sugar solution with a volume of 10.00mL. The results of this experiment explained that the mass of the sugar solution was 14.400g and its density was 1.440 g/mL. During phase 3, I primarily used a burette opposed to a pipet. The phase consisted of me pouring DI water into the burette which would proceed with opening the stopcock to fill the burette tip with the solution.

The important note that I learned is that if an air bubble is present, the flow of the liquid should be adjusted out of the burette to remove the air bubble from the tip. The events that followed included the recording of the initial and final volumes of the burette after the necessary amount of DI water was added into Erlenmeyer flask by using the stopcock. The end results were

an initial volume of 0.70 mL and a final burette volume of 23.60mL. The volume of water that was delivered by the burette was 22.90mL. The final stage of this section involved the same procedures with the added calculation of density.

The second key concept regarded the titration and concentration of vinegar. I learned many new and informative ideas with this portion of the lab. titration is a method to determine the concentration of an unknown solution by monitoring the quantity of a solution of known concentration necessary to react with it. This concept used past knowledge of acidity and challenged my application of these skills. The phases initiated with me filling a burette with sodium hydroxide with the initial volume resulting in 1.50mL. I proceeded to incorporate the skills I learned from the previous section regarding pipets to add 10.00mL of vinegar to the Erlenmeyer flask along with 50mL of DI water.

I then proceeded to add a phenolphthalein indicator to the vinegar solution with a magnetic stir bar. The magnetic stir bar was required to allow for the solution to be properly mixed by using the stir plate. Titration was started by adding standardized sodium hydroxide to the Erlenmeyer flask with the vinegar solution. The goal of this was to titrate to the end point, and when I neared the end point; I switched to smaller aliquots of NaOH. The endpoint was reached when the vinegar solution changed colors to a slightly pink-purple hue. The ending calculations of this experiment were rather interesting. There was a final volume regarding the burette of 19.35mL. The sodium hydroxide solution resulted with a volume of 17.85mL, and the molarity of the acetic acid resulted in 0.7199M.

Lab four was very informative because it taught me new key concepts that are important in chemistry. The concept of volumetric pipets and burettes were significantly important regarding titration as they were both used in the experiment. I learned how to use new lab tools

to help measure precise measurements, which is an important aspect of chemistry. I also learned the reasons behind titration, how to use an indicator, and how to identify the endpoint of the process. All these concepts are relevant to the world of chemistry because they are methods that allow for specific measurements and data to be recorded and analyzed such as the study of medicine highly utilizes these techniques.