Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Unit 9**

**Neutralization and Titration Lab**

Purpose: The purpose of this lab is to determine the concentration of an unknown acid by neutralizing 10 mL of HCl with .10 M NaOH.

Hypothesis: Based on the pH paper test the pH of the unknown acid is approximately\_\_\_\_\_\_\_\_\_\_\_\_ and the [H+] is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Color of pH paper: [H+] calculation:

Procedure:

1. Using a graduated cylinder measure exactly 10 mL of .10 M HCl and put the 10 mL into the 125mL Erlenmeyer Flask
2. Add 2 drops of phenolphthalein indicator to the flask
3. Fill the Buret with around 46mL of the NaOH. The exact amount does not matter, but you must record the starting amount and the ending amount of the base for each trial.
4. Slowly add acid to the flask until you being to see pink. Shake the flask until the pink color disappears. Continue to slowly add the acid. The goal is to get the lightest shade of pink possible without the solution turning back to clear. This will give you the most accurate results. Accuracy = Extra Credit
5. After neutralization dump the contents of the flask down the sink and rinse with plenty of water.
6. Repeat this process until you have a total of 3 trials.
7. Use your data to calculate the concentration of the HCl for three trials. Average these results.

Data:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Volume HCl used (mL) | Initial volume of NaOH (mL) | Final volume of NaOH (mL) | Volume of NaOH used (mL) |
| Trial 1 |  |  |  |  |
| Trial 2 |  |  |  |  |
| Trial 3 |  |  |  |  |

Calculations for concentration of hydrochloric acid:

Acid Base

M1V1 = M2V2

Trial 1:

Trial 2:

Trial 3:

Average of 3 trials:

Conclusion: Write a 5 sentence minimum conclusion. Discuss whether the hypothesis of the lab was supported or rejected by the results. Discuss any possible errors during the experiment and how they may have changed the results. Discuss ways in which the experiment could be improved to obtain more accurate results.

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