**Name: Titration Lab - Makeup**

**Purpose:** Your purpose is to determine the concentration of acid in a sample of Vinegar (Acetic Acid).

**Procedure:**

1. Use the Graduated Cylinder to measure 5 mL of vinegar. Pour this into a 100 mL flask. MEASURE YOUR VOLUME AS ACCURATELY AS POSSIBLE!

2. Your teacher will add 1-2 drops of the indicator phenolphthalein to your flask.

3. Fill the Burette up to the 0 with **0.1 M** **NaOH** (the base).

4. Slowly add NaOH to the beaker until you see a color change that does not disappear (very light pink). One partner should swirl the flask as you add the base.

**Post-Lab Questions:**

1. Write a balance chemical reaction for the neutralization reaction (Hint: The formula for vinegar (acetic acid) is HC2H3O2 and one of the products of the reaction is sodium acetate)
2. In a titration involving phosphoric acid, H3PO4, solution having a molarity of 0.345 M and a volume of 20.00 mL is titrated against a sample of Ca(OH)2. If the reaction requires 22.25 mL of base to reach the final endpoint, what is the molarity of the calcium hydroxide?

**Remember to add the NaOH dropwise and mix your solution between additions.**

4. Record your final volume of NaOH accurately.

5. Use the formula below to calculate the concentration of the Acetic Acid in the vinegar.

**Formula: Ma X Va = Mb X Vb**

*Ma = Molarity of Acid Va = Volume of Acid (5 mL)*

*Mb = Molarity of Base (0.1M) Vb = Volume of Base*

6. Repeat the same procedure 2 more times and complete the table by calculating the average Molarity of the Vinegar.

|  |  |  |
| --- | --- | --- |
| Titration | Volume of Base (NaOH) Used | CalculatedMolarity of Vinegar |
| #1 | 42 mL |  |
| #2 | 40.2 mL |  |
| #3 | 41.5 mL |  |
| **AVERAGE MOLARITY OF VINEGAR** |  |

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**Remember to add the NaOH dropwise and mix your solution between additions.**

4. Record your final volume of NaOH accurately.

5. Use the formula below to calculate the concentration of the Acetic Acid in the vinegar.

**Formula: Ma X Va = Mb X Vb**

*Ma = Molarity of Acid Va = Volume of Acid (5 mL)*

*Mb = Molarity of Base (0.1M) Vb = Volume of Base*

6. Repeat the same procedure 2 more times and complete the table by calculating the average Molarity of the Vinegar.

**Post-Lab Questions:**

1. Write a balance chemical reaction for the neutralization reaction (Hint: The formula for vinegar (acetic acid) is HC2H3O2 and one of the products of the reaction is sodium acetate)
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