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Group No.: 04

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**Exp. 10 Vinegar Analysis**

**Purpose:**

* To determine the percent by mass of acetic acid in vinegar.

**Materials and Reactions (if any):**

* 150 mL NaOH solution
* 15 mL of a single vinegar or 10 mL of each of two vinegars
* two 125- or 250-mL Erlenmeyer flasks
* 10-mL graduated cylinders
* 50-mL buret

**Procedure:**

1. Preparation of Vinegar Sample

* Calculate the volume of vinegar. Calculate the volume of vinegar that would be needed for the neutralization of 25 mL of the standardized NaOH solution. Assume the vinegar has a density of 1 g/mL and a percent acetic acid of 5% by mass, and the standardized NaOH solution is 0.1 M NaOH.
* Prepare the vinegar sample. Add the (approximate) calculated of one brand of vinegar to a clean dry 125- or 250-mL Erlenmeyer flask with a previously measured mass (±0.01 g) or a flask that has already been tared on the balance. Record the tared mass of the vinegar sample. Add 2 drops of phenolphthalein and rinse the wall of the flask with 20 mL of previously boiled, deionized water.
* Prepare the buret and titration setup. Rinse twice a clean 50-mL buret with ~5 mL of the standardized NaOH solution, making certain no drops cling to the inside wall. Fill the buret with the standardized NaOH solution, eliminate all air bubbles in the buret tip, and, after 10–15 seconds, read and record the initial volume. Place a sheet of white paper beneath the flask containing the vinegar sample.

1. Analysis of Vinegar Sample
2. Titrate the vinegar sample. Slowly add the NaOH solution from the buret to the acid, swirling the flask after each addition. Occasionally, rinse the wall of the flask with previously boiled, deionized water from your wash bottle. Continue addition of the NaOH titrant until the endpoint is reached. After 10–15 seconds, read and record the final volume of NaOH titrant in the buret
3. Repeat with the same vinegar. Refill the buret and repeat the titration at least once more with another sample of the same vinegar.
4. Consult with your instructor. You are to complete Parts A and B for a second vinegar to determine its average percent acetic acid or complete a third and/or fourth analysis of your original vinegar. For the additional analyses, revise the Report Sheet accordingly.
5. Calculations. Determine the average percent by mass of acetic acid in the vinegar(s).

**Calculations (if any):**