

Quantitative Analysis of Vinegar Lab

Name: _____

How much acetic acid is in vinegar???

In this lab, you will determine the % by weight of acetic acid in vinegar. This is determined by titrating a measured mass of vinegar with NaOH using phenolphthalein as an indicator.



At the endpoint in the titration, the # of moles of NaOH equals the # of moles of acetic acid. As you can see from the balanced equation, they react in a 1:1 ratio.

Procedure:

1. Obtain ca. 10~15 mL of vinegar (brand #1) in a graduated cylinder. Pour into a clean, 50-mL flask & record the mass of the solution. Add 2 drops phenolphthalein indicator.
2. Set-up a single buret. Prime it & fill it with 0.550 M NaOH solution.
3. Titrate until the endpoint. **Be careful!** You won't be able to back-titrate in this lab. Record initial & final volumes.
4. Repeat with vinegar brand #2.

Data Table:

brand #1: _____	brand #2: _____
mass of vinegar: _____	mass of vinegar: _____
initial volume NaOH: _____	initial volume NaOH: _____
final volume NaOH: _____	final volume NaOH: _____
volume NaOH used: _____	volume NaOH used: _____

Calculations:

The mass of acetic acid titrated in the vinegar is determined this way:

$$\text{Liters OH}^- \times \frac{\text{mol OH}^-}{\text{L}} \times \frac{\text{mol H}^+}{\text{mol OH}^-} \times \frac{\text{g HC}_2\text{H}_3\text{O}_2}{\text{mol}} =$$

Finally, the % acetic acid in the vinegar is calculated:

$$\frac{\text{g HC}_2\text{H}_3\text{O}_2}{\text{g vinegar}} \times 100\%$$

% acetic acid in brand #1: _____

% acetic acid in brand #2: _____