

# *Medical Chemistry Laboratory*



## *Experiment 4*

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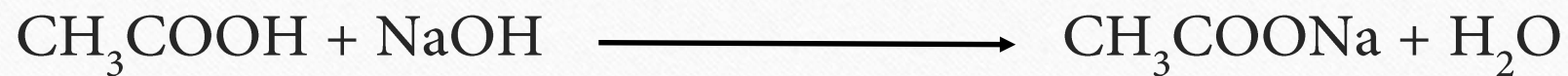
*Quantitative Analysis of Vinegar  
(Weight- Volume Percent)*



- Most vinegar contain 4-5% (W/V) acetic acid ( $\text{CH}_3\text{COOH}$ ), flavoring and colored agent may also be added. The most usual way of expressing solution strength is the weight per unit volume percent (W/V%). It refers to a solution prepared by dissolving measurement weight of the solute (gm) in a solvent to give 100 ml of the final solution.

$$\text{Weight - Volume percent} = \frac{\text{Wt. solute (gm)}}{\text{Vol. solution (ml)}} \times 100\%$$

- The weight-Volume percent of acetic acid in vinegars is determined by titration a measured volume of vinegar to a ph.ph indicator as end point with a measured volume of a standard NaOH solution.



- At the end point the number of equivalents of NaOH equals to number of equivalents of CH<sub>3</sub>COOH.



# *Procedure*

1. Pipette exactly 10ml of the sample (Vinegar) in to conical flask.
2. Add 2 drops of ph.ph indicator (the color of solution is colorless).
3. Titration versus standard NaOH until the end point occurs (the color of solution become pink).
4. Record the volume of vinegar from the burette.

# Calculation

**1. Determination concentration of Vinegar (Acid) from the following equation:**

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$$N_a \times V_a = N_b \times V_b$$

**2. Calculate the number of grams by using equation:**

$$\text{No. of grams} \left( \frac{\text{gm}}{\text{L}} \right) = N_a \times (\text{GEW})_a$$

❖ Where GEW is equivalent weight of  $\text{CH}_3\text{COOH} = 60 \text{ gm/eq}$

**3. Calculate the percent of  $\text{CH}_3\text{COOH}$  in vinegar:**

$$\% \text{CH}_3\text{COOH in vinegar} = \text{No. of grams} \times \frac{100}{1000}$$