**Ministry of Higher Education and Scientific Research**

**Al-Mustaqbal University**

 **(Chemistry Analytical lab)**

**Experiment No.5**

 **Acidity of Vinegar**

**Prepared by**

**Eng:Fatima Oday Ali**

**Eng:Ahmed Abbas**

***Vinegar contains about 5%by volume acetic acid CH₃COOH most of the***

***remaining 95%is water plus small quantities of ethyl alcohol and other carboxylic acid. The acid contents or vinegar may determine quantitatively by volumetric titration with standard solution of sodium hydroxide solution using phenolphthalein indicator.***

***Part (A): Calibrate the solution of NaOH by using standard solution of 0.1N HCl.***

 ***NaOH +HCl NaCl + H₂o***

***Procedure:***

***• Transfer 10.0ml of 0.1 N HCl into a clean 250ml. conical flask and 2 drops of***

***phenolphthalein (ph.ph.) indicator.***

***• Titrate against sodium hydroxide solution …stop titration when the color of***

***solution changes from colorless to pink color.***

***N1× V 1 = N2 × V 2***

***Calculate the concentration of NaOH by:***

 ***N1= concentration of NaOH V1= volume of NaOH N 2 = concentration of HCl V 2 = volume of HCl***

***Part (B): Titration of weak acid CH3COOH with strong calibrated base.***

**CH3COOH+NaOH CH3COONa + H2O**

 **• Put 5ml sample of vinegar into 25ml weighted clean beaker. Then determine the weight of net vinegar. Transfer the sample quantitatively to 100ml clean volumetric flask then dilute to the mark. • Take 10 ml of your prepared solution in step 1, and put it into 250ml conical flask with 2 drops of ph.ph. indicator. Titrate solution with calibrated standard NaOH. Continue the titration until change of color appears from colorless to pink color.**

**• Determine the concentration of CH 3COOH in vinegar.**

 **• Calculate the weight of CH3COOH.**

**• Calculate the percentage of CH3COOH wt/wt% and wt/vol.%.**

 **N 1× V1 = N 2 × V 2**

***Calculation:***

***N1= Conc. of NaOH V1= volume of NaOH***

***N2 = Conc. of Acetic acid after diluted in 100ml of dist.***

***Water V2 = volume of vinegar (10ml).***

***Equivalent weight of acetic acid = 60.05***

***Discussion:***

***• What is the pH value at the equivalent point?***

***• What ions are present in the solution at the equivalent point (only those in significant amounts)?***

***• Calculate the Molarity of NaOH, why you have to calibrate the base solution before you can use it?***