

Lab-report # 7

Date: 97-12-05 Time: 12.50 – 14.40

Determination of ethanoic acid content of vinegar:

Work to be done:

- To find out how much ethanoic acid common vinegar contains.

Chemicals and apparatus:

- Vinegar
- Standard flask (100 cm³)
- Standard sodium hydroxide solution (0.1M)
- Phenolphthalein indicator
- Balance (accurate to 0.01 g)
- Pipette (25cm³ and 50 cm³)
- Conical flask (100 cm³)
- Wash bottle/distilled water
- Dropping pipette

Lab:

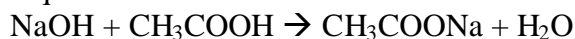
First I weighted 20.09 grams of vinegar into a 100 cm³ standard flask and added distilled water until I reached the 100 cm³ mark, and mixed the solution very well. I then took 10 cm³ of this solution and used it in a titration with the 0.1M sodium hydroxide solution, using phenolphthalein to indicate the acid-base equilibrium.

I did this titration three times and the results were 19 cm³, 19.2 cm³ and 20.7 cm³ (average 19.63 cm³).

I then use the formula $n = c * v$ for the amount of NaOH;

$$19.63 * 10^{-3} * 0.10 = 1.963 * 10^{-3} \text{ mol}$$

And since the equation for the reaction is



there must be the same amount of CH₃COOH

and $1.963 * 10^{-3}$ mol of CH₃COOH weight;

$$1.963 * 10^{-3} * 60 = 0.11778\text{g CH}_3\text{COOH} / 10 \text{ cm}^3 * 10 = 1.1778\text{g} / 100 \text{ cm}^3$$

$$\frac{1.1778\text{g}}{20.09\text{g}} * 100 = 5.86\%$$

The conclusion is that vinegar contains 5.86% ethanoic acid. On the bottle of vinegar it said that is contained 6%, so I think that the experiment was a success.