

EXPERIMENT 2 DETERMINATION OF THE RELATIVE MOLECULAR MASS OF AN ACID

Task:

In today's laboratory session you are required to perform the following:

1. Standardize a solution of sodium hydroxide using a standardized hydrochloric acid solution.
2. Determine the relative molecular mass of an acid (solid sample) using the sodium hydroxide solution.

A. Standardization of Sodium Hydroxide using Hydrochloric Acid

Procedure:

Pipette 25 mL aliquots of standardised HCl solution into conical flasks (250 mL). (*Do you remember for the last lab how an HCl solution can be standardized*). Fill a clean burette with the NaOH provided. Titrate the samples using phenolphthalein as an indicator. Repeat until concordant results are obtained. Record your results in tabular form in your note book.

(Why is there need to standardize NaOH?)

B. Determination of the Relative Molecular Mass of an Acid (Solid Sample)

Procedure:

Weigh out accurately about 125 mg of the solid acid sample provided into a conical flask (250 mL). [Record the sample number in your notebook]. Dissolve the sample in about 50 mL distilled water. Titrate this solution with the sodium hydroxide (from A) in your burette using phenolphthalein as indicator. Do this in duplicate.

Record the results in your note book. Wash your burette thoroughly with HCl solution initially, then distilled water after using sodium hydroxide in it. Why is this necessary?

Calculations:

From Experiment 2, calculate:

- (i) The number of moles NaOH used in the titration
- (ii) the number of moles NaOH used in titrations against each separate sample of the solid acid.

Assuming that this acid is monobasic, calculate:

- (i) Number of moles of monobasic acid used in each separate sample
- (ii) Average molar mass of this monobasic acid