National University –SUDAN

Faculty of Clinical and Industrial Pharmacy

Second Year (**Batch-PA-14**)-Semester Four

Professional Skills-2- Laboratory Skills-1

(**PA-SKILL-221**)

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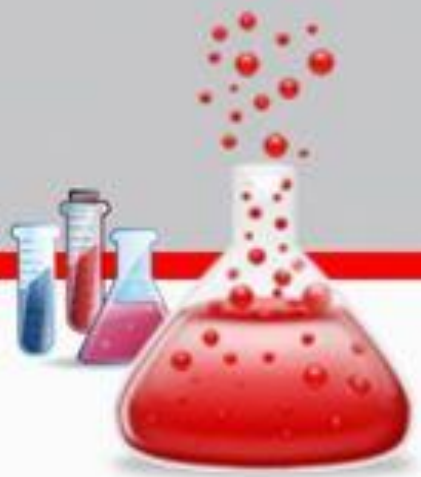

Standardization and Titration

Objectives

By the end of this lesson the student is expected to understand

1- To define standard solutions

2- To demonstrate Acid-Alkali titrations

3- To calculate concentrations of solution in volumetric analysis

4- To practice on writing a laboratory report on volumetric analysis

Standardizing a Sodium Hydroxide (NaOH) Solution

In a titration, it is critical to know the exact concentration of the titrant (the solution in the buret which will be added to the unknown) in order to determine the concentration of the solution being tested. We will standardize the ~0.1 M NaOH solution (the titrant) with potassium hydrogen phthalate (KHP, $KC_8H_4O_4H$) using phenolphthalein as the indicator. KHP is a weak acid and reacts with base in the following way:

To Standardize:

1.Weigh ~0.8 g of dried KHP (MW = 204.23 g/mol) into an Erlenmeyer flask and dissolve in 50-75 mL of distilled water. Record the amount of KHP and water used.

2.Add 4 drops of indicator into the flask and titrate to the first permanent appearance of pink. Near the endpoint, add the NaOH dropwise to determine the total volume most accurately.

3.Calculate the concentration of NaOH in the following way:

Calculate Concentration of KHP:

$$\text{\_\_ g KHP} \left(\frac{\text{1 mol KHP}}{\text{204.23 g}} \right) = \text{\_\_ moles KHP}$$

MW KHP

$$\frac{\text{\_\_ moles KHP}}{\text{\_\_ L } H_2O \text{ used}} = \text{\_\_ M (mol/L) KHP}$$

Calculate Concentration of NaOH:

Remember: There are 1000 mL in a L and 1000 mg in a gram.

1.Report the concentration of NaOH to the class. An average number will be determined to give the most reliable value of NaOH concentration. Do not discard the remaining NaOH – you will use this for the rest of these experiments.

$$\_\_ \text{ moles KHP} \left(\frac{1 \text{ mol NaOH}}{1 \text{ mol KHP}} \right) = \_\_ \text{ moles NaOH}$$

from balanced eqn

$$\frac{\_\_ \text{ moles NaOH}}{\_\_ \text{ L NaOH used}} = \_\_ \text{ M (mol/L) NaOH}$$

For more information's please watch video P-5

THANK YOU ☺