**EXP. 5: Quantitative Assay of Aspirin Tablets**

**Methods of Analytical chemistry is of two types**

**1. Qualitative Analysis:**

It determines the presence or absence of a particular compound, but not the mass or concentration. By definition, qualitative analysis does not measure quantity.

**2. Quantitative Analysis:**

It determines how much of each component, or of specified component is present in a given sample.

**Methods of Quantitative Chemical Analysis:**

1. Volumetric (Titrimetric) analysis.

2. Gravimetric analysis.

3. Spectrophotometric analysis.

**Requirements for a Titrimetric Assay:**

1. The reaction can be represented by a chemical equation.

2. The reaction should be relatively fast.

3. The reaction should be complete & irreversible.

4. The endpoint should be easily detected.

**Types of Titrations:**

1. Forward titration *(direct titration).*

**2.** Back titration *(indirect titration).*

**Back Titration:**

It includes the addition of an excess of a standard solution to a weighted amount of a sample and then the excess unreacted standard solution is determined by titration with another standard solution

**Back Titration Is Used For:**

1- Volatile substances, e.g., NH3.

2- Insoluble or slightly soluble substances, e.g. CaCO3

3- Substances for which the quantitative reaction proceeds rapidly only in

the presence of excess of reagent, e.g., Lactic acid & Aspirin.

4- Substances which decompose on heating, e.g. , Formaldehyde.

**Principle:**

The determination of the amount of aspirin present in a tablet dosage form

is done by alkaline hydrolysis of aspirin using N/2 NaOH standard solution

followed by back titrating of the excess unreacted alkali using N/2 HCl std.

solution & phenol red as indicator.



**Procedure:**

1. Crushed 20 aspirin tablets (0.3 g aspirin each).

2. Recorded the weight of the powder.

3. Using 0.5 g of crushed powdered sample, Aspirin readily dissolved in dilute NaOH solution and hydrolyzed completely by heating for 10 minutes with an excess of a base.

4. Titration of the excess unreacted alkali with N/2 HCl standard solution using phenol red indicator: It’s also known as phenolsulfonphthalein (PSP) is a pH indicator. Analyzed aspirin by back titration. Then recorded the results in the following data table.

5. As in other quantitative determination involving boiling with a standard alkali, cooling and back titrating the excess, it’s necessary to carry out a blank experiment without the aspirin.

In order to:

1- Minimize any error due to small unavoidable losses.

2- Heating and cooling an alkaline liquid results in an apparent change

in strength if certain indicators are used.



**Chemical Factor:**





