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Diploma in Pharmacy 1st Year
Pharmaceutical Chemistry
Experiment

To perform the assay of Ibuprofen by Alkalimetry.

Aim:

To perform the assay of Ibuprofen by Alkalimetry.

Reference :

‘ Dr. Gupta G.D. , Dr. Sharma Shailish , Kaur Baljeet ’ “Practical Manual of Pharmaceutical Chemistry” Published by Nirali Prakashan, Page no 49 - 51

Apparatus and Material Required :

Burette glass funnel, wintetric flask, pipette, measuring cylinders, conical flasks, beaker, gla phenolphthaler tile, bench mat, ibuprofenyliyonical flasks (95%), and phenolphthalein indicator solutuobus.

Theory:

The assay of Ibuprofen is carried out by aqueous acid base titration. The kind of neutralisation titration is weak acid with strong base. It is based on the neutralisation of ibuprofen with sodium hydroxide and the use of phenolphthalein as an indicator Ibuprofen is a phenolic acid with the souphenolphthalein propanoic. Ibuprofen containing carboxylic acid reacts with NaOH to create the carboxylic acid's sodium salt. The salt is usually soluble in water .

$$X\text{-}COOH \text{ —} + NaOH + X\ COO\text{-}Na^{-} + H_2O$$

Procedure:

1) 20 Ibuprofen tablets should be taken at random and weighed by using an electronic weighing balance and powdered using mortar and pestle.
2) A sample of powder containing 0.5g ibuprofen should be extracted for 15 minutes with 20 ml chloroform and filtered via a filter paper.
3) The residue should be washed with 3 10 ml. chloroform, and the combined filtrate should be gently evaporated in a current of air to dryness. The residue

should be dissolved in 100 ml of ethanol (96%) before being neutralised with phenolphthalein solution.

4) The solution should be titrated to the end point with 0.1 M sodium hydroxide and phenolphthalein solution as an indicator. If each ml of 0.1 M sodium hydroxide is equivalent to 0.02063 g of $C_{13}H_8O_2$, the concentration of ibuprofen should be determined.

Observation Table

S. No.	Volume of Ibuprofen	Burette Reading		Volume of Sulphuric Acid Rundown
		Initial	Final	
1	30ml	0	15	15
2	30ml	15	18	18
3	30ml	18	20	20

Calculation

Weight of powder of 20 tablet Ibuprofen = 7.9850g

1 tablet contains 200mg Ibuprofen.

20 tab = 20×200=4000mg = 4g Ibuprofen

$$4g \text{ Ibuprofen contains} = \frac{0.5}{4} \times 7.9850 = 0.9981g \text{ tab powder}$$

Thus, 0.9981g of tablet powder weight was dissolved with 20ml chloroform.

$$\text{Average} = \frac{15+18+20}{3}$$

$$= \frac{53}{3} = 17.66$$

$M_1 V_1 = M_2 V_2$

$$M_2 = \frac{M_1 V_1}{V_2} = \frac{0.1 \times 15.5}{17.66} = 0.0877$$

$$\text{Purity} = \frac{0.02063x \text{ V Molarity (actual)}}{\text{Weight of sample x Molarity (given)}} \times 100$$

$$= \frac{0.02063 \times 17.66 \times 0.0877}{0.1 \times 0.319} \times 100$$

$$= \frac{0.0319}{0.0319} \times 10$$

Where,

V = 17.66

Weight sample = 0.319

Molarity (given) = 0.1M

Purity = 10%

Result: The percentage purity of the ibuprofen was found to be 10%.

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