



Al-Mustaqbal University College
Department of Pharmacy
Second Stage – First Semester
Physical Pharmacy Laboratory



Determination of the Ascorbic Acid (vitamin C) in Tablets

Sixth Experiment

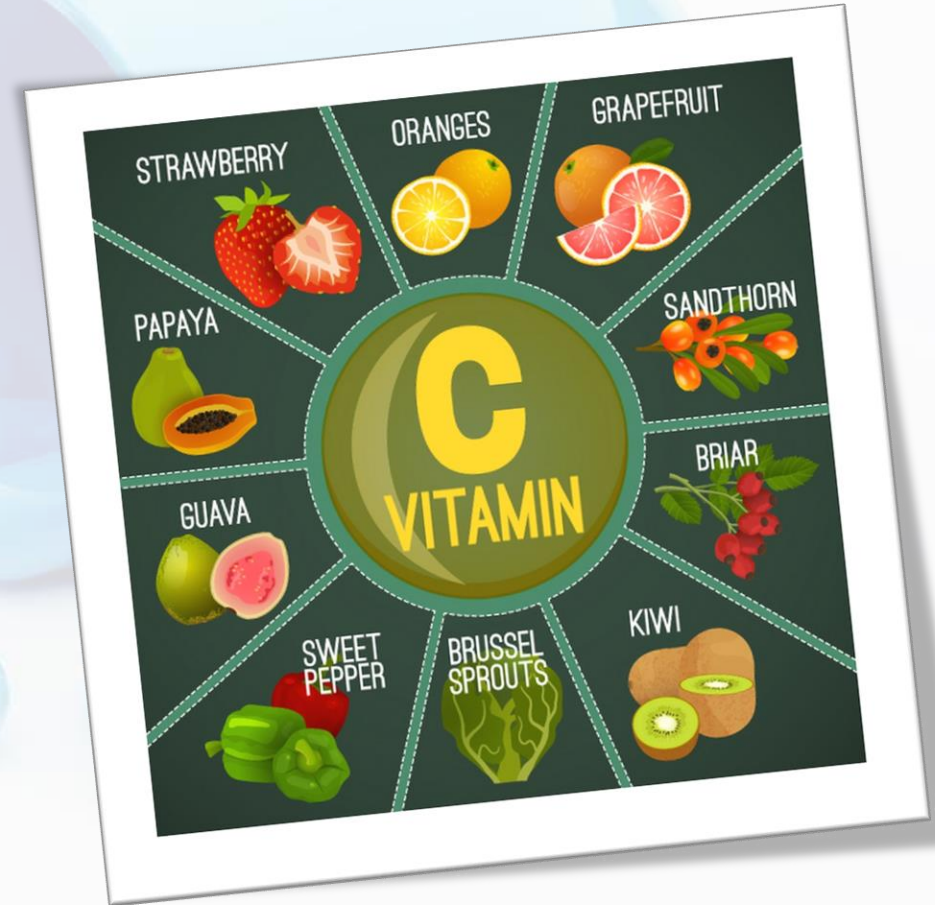
Asst. Lec.
Alaa Salman Al-Labban

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VITAMIN C

- **Vitamin C, or ascorbic acid, is a water-soluble vitamin.**
- **This means that it dissolves in water and is delivered to the body's tissues but is not well stored, so it must be taken daily through food or supplements.**



VITAMIN C

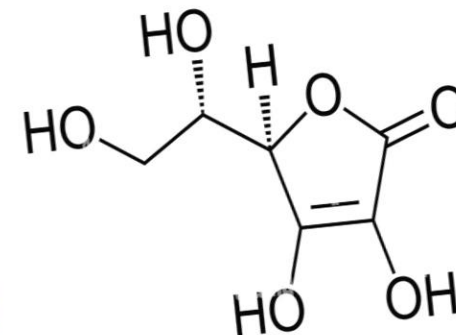
➤ **Vitamin C** has several important functions, these include:

- ✓ Helping to **protect cells** and keeping them **healthy**
- ✓ Maintaining **healthy skin, blood vessels, bones and cartilage.**
- ✓ Helping with **wound healing.**

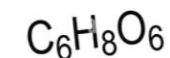


Determination of the Ascorbic Acid (vitamin C) in Tablets

- This experiment uses to analyze a tablet of **Vitamin C** (or other drug containing this compound) and calculate the percentage of **ascorbic acid**, $C_6H_8O_6$, present in it.

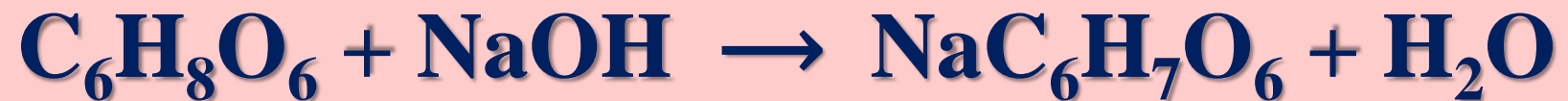


Vitamin C
Ascorbic acid



Determination of the Ascorbic Acid (vitamin C) in Tablets

- **Vitamin C tablets contain ascorbic acid as the active ingredient**, however, it is mixed with such fillers as **starch** which however does not obscure the endpoint.
- The reaction of **ascorbic acid** with **sodium hydroxide** will produce the acid salt, **sodium hydrogen ascorbate**.



Determination of the Ascorbic Acid (vitamin C) in Tablets

- **Vitamin C** behaves as **monoprotic acid** when titrated using **Phenolphthalein** as indicator.
- This means that the **number of moles of NaOH** in titration is equal to the number of moles of the **ascorbic acid**.



Glassware and Apparatus

- **Pestle and mortar**
- **Beaker**
- **Pipette**
- **Burette**
- **Conical flask**
- **Stirrer**
- **Stand and clamp**



Chemicals

- **Vitamin C tablets**
- **NaOH**
- **Distilled water**
- **Phenolphthalein indicator**



Procedure

- 1. Measured the mass of one Vitamin C tablet.**
- 2. Grind up a Vitamin C tablet to a fine powder using the pestle and mortar.**
- 3. Transfer powder Vitamin C to Erlenmeyer flask, Added 10 mL of distilled H₂O to the flask.**
- 4. Add 2-3 drops of phenolphthalein indicator solution (Swirl for at least 3 minutes).**
- 5. Titrate carefully with 0.05M sodium hydroxide (Swirl the flask continuously, The NaOH solution should be added very slowly, The end point is reached at the first instance of the pink color persisting).**
- 6. Record the volume of the sodium hydroxide used.**

Calculations

1. Calculate Ascorbic acid concentration from this relation:

$$M_1 \times V_1 \text{ (NaOH)} = M_2 \times V_2 \text{ (Ascorbic acid)}$$

$$0.05 \times V \text{ from burette (NaOH)} = M_2 \times 10 \text{ (Ascorbic acid)}$$



Calculations

2. Calculate weight of Ascorbic acid from this relation:

$$wt = \frac{M \times Mwt \times Vml}{1000}$$

$$wt = \frac{M \times 176 \times 10}{1000}$$



Calculations

3. Calculate of Ascorbic acid % from this relation:

$$\text{Ascorbic acid}\% = \frac{\text{wt (from titration)}}{\text{wt of one tablet}} \times 100$$



