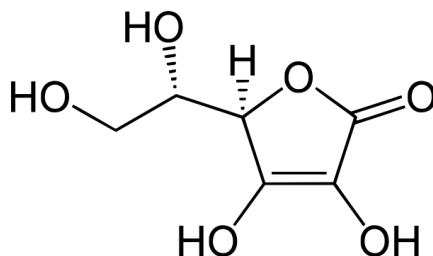




Practical
Organic Pharmaceutical Chemistry
4th Stage (2nd course)
Lab. 3

Prepared by:
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2017-2018

Assay of Ascorbic acid



Molecular Weight 176.12g/mol.

Properties of Ascorbic Acid:

- White Powder or Crystals , But Impure Sample can Appear Yellowish.
- If the Medium is Alkaline on Exposure to Air and Light, it Gradually Darkens.
- Soluble in Water and Insoluble in Chloroform and Ether.

Uses of Ascorbic Acid:

- 1) Treatment of Scurvy (Which is a Disease Caused by the Deficiency of Ascorbic Acid).
- 2) Maintain the Health of Skin, Cartilage, Bone and Blood Vessels.
- 3) Protect Body's Cell from Damage and Infection.
- 4) Increase Immunity It's used in Combination with Drug in Treatment of Cold and Flu .
- 5) Used as Anti-Oxidant and Reducing Agent.

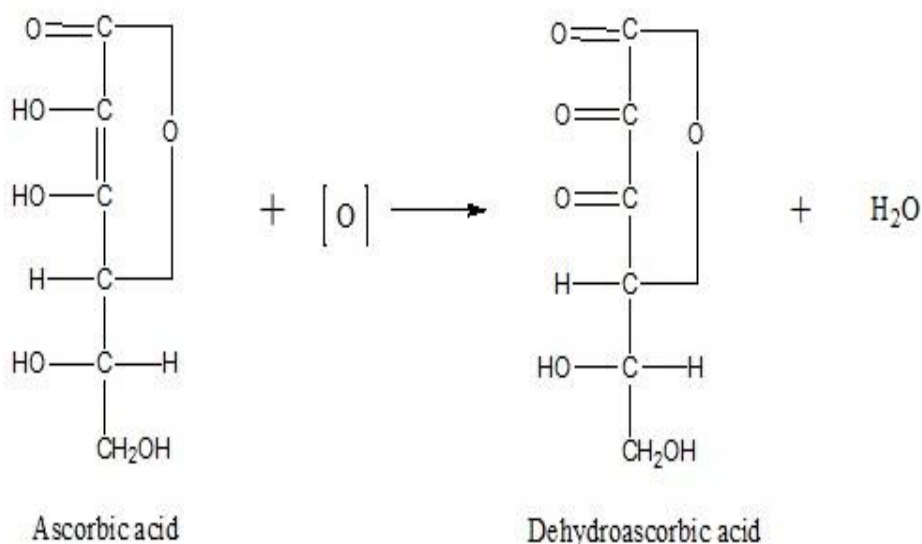
Ascorbic Acid as Anti-Oxidant Mechanism:

Oxidation:- Is a Chemical Reaction that Produce Free Radicals Leading to Chain Reactions That may Damage Cells.

- ❖ So When we Used Ascorbic Acid as Anti-Oxidant , Terminate these Chain Reactions by Prevent the Formation of Free Radicals and Hence Prevent Cell Damage.

Ascorbic Acid as Reducing Agent:

It's Oxidized in the Presence of Air, the Reaction Catalyzed By Traces of Some Metals Especially Copper and Converted to (Dehydro Ascorbic Acid) DHA. So we can't Store in Metallic Container.



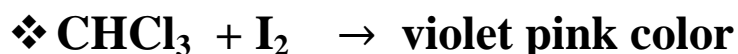
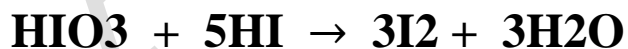
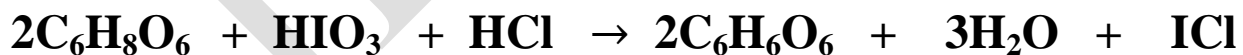
Bio Synthesis of Ascorbic Acid:

- 1) Ascorbic Acid Found in Plant.
- 2) Ascorbic Acid Found in Animals (Liver) so by the Action of (L-Gulonolacton Oxidase) Enzyme which Convert Glucose to Ascorbic Acid.

Chemical Principle:

Principle of Ascorbic Acid Assay:

- It Depends on Oxidation-Reduction Reaction.
- Chemical Methods Replaced the Biological Methods Since they are less Time Consuming, more Precise and less Expensive.
- The Chemical Methods Generally Depends upon the Reducing Properties Of Ascorbic Acid [the Oxidation of Ascorbic Acid is done using With a Standard Solution of Pot. Iodate M/100.] or 0.01 M KIO₃.



Procedure:

1. Dissolve Vitamin C Tablet in Exactly 400 ml D.W.
2. Transfer 10 ml of the Solution to a Glass Stopped Conical Flask.
3. Add 5 ml conc. HCl and 1 ml CHCl_3 .
4. Titrate Against 0.01 M KIO_3 With Strong Shaking till the Disappearance of Violet Color From Chloroformic Layer.
5. Record the Volume of KIO_3 Used .

Calculation:

1 Mole of KIO_3 React with 2 Mole of Ascorbic Acid

❖ 1 Mole of $\text{KIO}_3 = 2$ Mole of Ascorbic Acid

1 Mole of $\text{KIO}_3 = 2$ M.Wt of Ascorbic Acid

$(V_L) * 1\text{M of } \text{KIO}_3 = 2 * 176.13 \text{ of Ascorbic Acid}$

$(1000\text{ml} * 1\text{M of } \text{KIO}_3 = 352.26 \text{ of Ascorbic Acid}) / 1000$

$(1\text{ml} * 1\text{M of } \text{KIO}_3 = 0.35226\text{g of Ascorbic Acid}) / 100$

$1\text{ml} * 0.01\text{M of } \text{KIO}_3 = 0.00352\text{g of Ascorbic Acid}$

Each 1 ml. of 0.01M KIO_3 equivalent to **0.00352 g of ascorbic acid.**

❖ **Dilution Factor = Total Volume after Dilution / Volume Taken for Assay**

❖ **Wt of Ascorbic Acid = Vol.of KIO_3 Used * Ch. Factor * Dil.Factor**

❖ **Purity % = Wt A.A/Wt Taken * 100%**