

## Practical 5 – Chapter 1

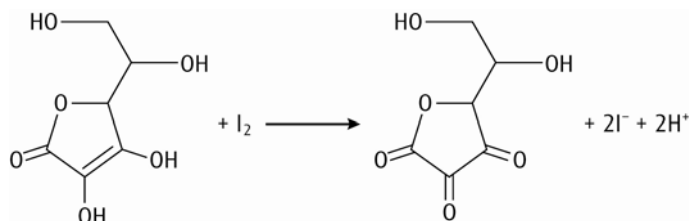
### Determination of vitamin C concentration in a solution

Vitamin C can be determined quantitatively with the method of iodometry.

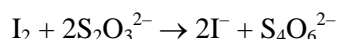
Molecular iodine is produced in acidic solution by reacting iodate ions ( $\text{IO}_3^-$ ), with an excess of iodide ions ( $\text{I}^-$ ).



The vitamin C reduces some of the iodine to iodide



and any excess iodine is titrated against a standard sodium thiosulfate solution:



You are required to determine the concentration of vitamin C in a solution.

#### Safety

- Ethanedioic acid is harmful in contact with the skin and if swallowed.
- Potassium iodate is harmful.
- Wear eye protection.

#### What to do

- 1 Fill the burette with sodium thiosulfate solution ( $0.070 \text{ mol dm}^{-3}$ ).
- 2 Measure out  $25.0 \text{ cm}^3$  of the vitamin C solution into a conical flask (using a pipette).
- 3 Immediately add 0.20 g of ethanedioic acid (oxalic acid) to stabilise the vitamin C to aerial oxidation (**Care!**).
- 4 Add 1 g of potassium iodide (this is excess) and  $30 \text{ cm}^3$  of  $0.3 \text{ mol dm}^{-3}$  sulfuric acid (using a measuring cylinder is OK – an excess is added).
- 5 Using a pipette, add  $25.0 \text{ cm}^3$  of the potassium iodate solution ( $0.010 \text{ mol dm}^{-3}$ ) to the mixture in the conical flask (**Care!**).
- 6 Titrate the potassium iodate solution against the sodium thiosulfate solution until the solution becomes a straw colour (pale yellow).
- 7 Add a few drops of starch solution and titrate carefully until the solution is colourless.