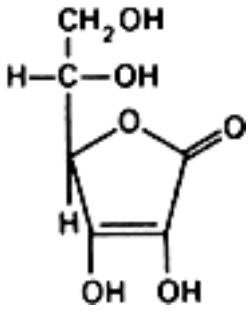
Ascorbic acid (Acidum ascorbicum)

Molecular formula. $C_6H_8O_6$

Relative molecular mass. 176.1

Graphic formula.



Chemical name. L-Ascorbic acid; CAS Reg. No. 50-81-7.

Description. Colourless crystals or a white or almost white, crystalline powder; odourless or almost odourless.

Solubility. Freely soluble in water; soluble in ethanol (~750 g/l) TS; practically insoluble in ether R.

Category. Antiscorbutic.

Storage. Ascorbic acid should be kept in a tightly closed, non-metallic container, protected from light.

Additional information. Ascorbic acid in solution deteriorates rapidly in contact with air; it has an acid taste. Even in the absence of light, Ascorbic acid is gradually degraded on exposure to a humid atmosphere, the decomposition being faster at higher temperatures.

Requirements

Definition. Ascorbic acid contains not less than 99.0% and not more than 100.5% of $C_6H_8O_6$.

Identity tests

A. Dissolve 0.1 g in 2 mL of water, add a few drops of nitric acid (~130 g/l) TS and a few drops of silver nitrate (40 g/l) TS; a dark grey precipitate is produced.

B. Dissolve 0.04 g in 4 mL of water, add 0.1 g of sodium hydrogen carbonate R and about 20 mg of ferrous sulfate R, shake and allow to stand; a deep violet colour is produced, which disappears on the addition of 5 mL of sulfuric acid (~100 g/l) TS.

C. Melting temperature, about 190°C with decomposition.

Specific optical rotation. Use a 50 mg/mL solution; $[\alpha]_D^{20\,°C}$ = +20.5° to +21.5°.

Heavy metals. Use 1.0 g for the preparation of the test solution as described under 2.2.3 Limit test for heavy metals, Procedure 3; determine the heavy metals content according to Method A; not more than 20 µg/g.

Clarity and colour of solution. A solution of 0.50 g in 10 mL of water is clear and not more intensely coloured than standard colour solution Rd1 when compared as described under 1.11.1 Colour of liquids.

Readily carbonizable substances. Dissolve 0.10 g in 10 mL of sulfuric acid (~1760 g/L) TS. After 15 minutes the solution is not more intensely coloured than standard colour solutions Yw1 or Gn1 when compared as described under 1.11.1 Colour of liquids.

Sulfated ash. Not more than 1.0 mg/g.

Assay. Dissolve about 0.20 g, accurately weighed, in a mixture of 25 mL of carbon-dioxide-free water R and 25 mL of sulfuric acid (~100 g/l) TS. Titrate the solution at once with iodine (0.05 mol/l) VS using starch TS as indicator, added towards the end of the titration, until a persistent blue colour is obtained. Each mL of iodine (0.05 mol/l) VS is equivalent to 8.806 mg of $C_6H_8O_6$.