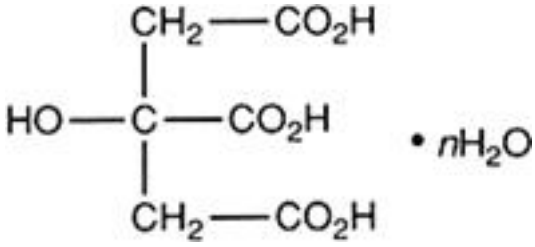
Citric acid (Acidum citricum)

Citric acid, anhydrous

Citric acid monohydrate



n = 0 (anhydrous)

n = 1 (monohydrate)

$C_6H_8O_7$ (anhydrous)

$C_6H_8O_7,H_2O$ (monohydrate)

Relative molecular mass. 192.1 (anhydrous); 210.1 (monohydrate).

Chemical name. Citric acid; 2-hydroxy-1,2,3-propanetricarboxylic acid; CAS Reg. No. 77-92-9.

Citric acid monohydrate; 2-hydroxy-1,2,3-propanetricarboxylic acid monohydrate; CAS Reg. No. 5949-29-1.

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

Solubility. Very soluble in water; freely soluble in ethanol (~750 g/l) TS; sparingly soluble in ether R.

Category. Acidifying agent; buffer component.

Storage. Citric acid should be kept in a well-closed container.

Labelling. The designation on the container of Citric acid should state whether it is the monohydrate or the anhydrous form.

Additional information. Citric acid monohydrate effloresces in dry air.

Requirements

Citric acid contains not less than **99.5%** and not more than the equivalent of **101.0%** of $C_6H_8O_7$, calculated with reference to the anhydrous substance.

Identity test

A 20 mg/mL solution yields the reactions described under 2.1 General identification tests as characteristic of citrates.

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 1; determine the heavy metals content according to Method A; not more than 10 µg/g.

Barium. Dissolve 1 g in 7.8 mL of sodium hydroxide (~80 g/l) TS and dilute to 10 mL with water. Acidify half of this solution with sulfuric acid (~100 g/l) TS and allow to stand for at least 1 hour. Compare with the untreated portion of solution; it remains clear.

Oxalates. Dissolve 1 g in 10 mL of water, neutralize with ammonia (~100 g/l) TS, add 0.35 mL of hydrochloric acid (2 mol/l) VS, cool, and add 2 mL of calcium chloride (55 g/l) TS; no turbidity is produced.

Sulfates. Dissolve 0.1 g in 10 mL of water, add 1 mL of barium chloride (50 g/l) TS to which 1 drop of hydrochloric acid (~420 g/l) TS has been added; no turbidity is produced.

Water. Determine as described under 2.8 Determination of water by the Karl Fischer method, Method A.

- For the anhydrous form use 1 g; the water content is not more than 10 mg/g.

- For the monohydrate use 0.15 g; the water content is not less than 75 mg/g and not more than 90 mg/g.

Sulfated ash. Not more than 1.0 mg/g.

Assay. Dissolve about 1.5 g, accurately weighed, in 50 mL of carbon-dioxide-free water R and titrate with carbonate-free sodium hydroxide (1 mol/l) VS, using phenolphthalein/ethanol TS as indicator. Repeat the procedure without the Citric acid being examined and make any necessary corrections.

Each mL of carbonate-free sodium hydroxide (1 mol/l) VS is equivalent to 64.03 mg of $C_6H_8O_7$.