CITRIC ACID

Prepared at the 79th JECFA (2014), published in FAO JECFA Monographs 16 (2014), superseding specifications prepared at the 53rd JECFA (1999), published in FNP 52 Add 7 (1999). Group ADI "Not limited" for citric acid and its calcium, potassium, sodium and ammonium salts established at the 17th JECFA in 1973.

SYNONYMS INS No. 330

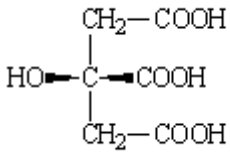
DEFINITION Citric acid may be produced by recovery from sources such as lemon or pineapple juice or fermentation of carbohydrate solutions or other suitable media using *Candida* spp. or non-toxicogenic strains of *Aspergillus niger*

Chemical names 2-hydroxy-1,2,3-propanetricarboxylic acid

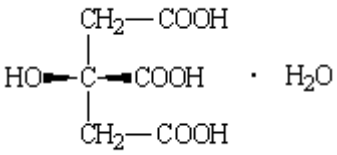
C.A.S. number 77-92-9 (anhydrous)
5949-29-1 (monohydrate)

Chemical formula $C_6H_8O_7$ (anhydrous)
$C_6H_8O_7 \cdot H_2O$ (monohydrate)

Structural formula



Anhydrous



Monohydrate

Formula weight 192.13 (anhydrous)
210.14 (monohydrate)

Assay Not less than 99.5% and not more than 100.5% on the anhydrous basis

DESCRIPTION White or colourless, odourless, crystalline solid; the monohydrate form effloresces in dry air

FUNCTIONAL USES Acidifier; sequestrant; antioxidant synergist; flavouring agent (see "Flavouring agents" monograph)

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol.4) Very soluble in water; freely soluble in ethanol; slightly soluble in ether

Test for citrate (Vol. 4) Passes test

PURITY

Water (Vol. 4)	Anhydrous: Not more than 0.5% (Karl Fischer Method) Monohydrate: Not less than 7.5% and not more than 8.8% (Karl Fischer Method)
Sulfated ash (Vol. 4)	Not more than 0.05% (Method I, use 20 g sample)
Oxalate (Vol. 4)	Not more than 100 mg/kg Dissolve 1.0 g of sample in 4 ml of deionized water, and proceed according to the Oxalate Limit Test (Volume 4). The absorbance of the solution, read at 520 nm, is not more than that of a standard solution. Prepare the standard solution by dissolving 100 mg of oxalic acid (140 mg oxalic acid dehydrate) in 1000 ml of deionized water and dilute 1 ml with 3 ml of deionized water.
Sulfates (Vol. 4)	Not more than 150 mg/kg Test 20 g of the sample by the Sulfates Limit Test (Volume 4) using 6.0 ml of 0.01N sulfuric acid in the standard
Readily carbonizable substances	Heat 1.0 g of sample with 10 ml of 98% sulfuric acid in a water bath at 90±1^{o} for 60 min. No colour darker than *Matching Fluid K* (25^{o}) should be produced (not more than 0.5 absorbance units at 470 nm in a 10 mm cell).
Lead (Vol. 4)	Not more than 0.5 mg/kg Determine using an AAS (Electrothermal atomization technique) appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the methods described in Volume 4 (under “General Methods, Metallic Impurities”).
METHOD OF ASSAY	Weigh, to the nearest mg, 2.5 g of the sample and place in a tared flask. Dissolve in 40 ml of water and titrate with 1 N sodium hydroxide, using phenolphthalein TS as the indicator. Each ml of 1 N sodium hydroxide is equivalent to 64.04 mg of $C_6H_8O_7$.