TRISODIUM CITRATE

Prepared at the 19th JECFA (1975), published in NMRS 55B (1976) and in FNP 52 (1992). Metals and arsenic specifications revised at the 59th JECFA (2002). An ADI not limited' was established at the 17th JECFA (1973)

SYNONYMS Sodium citrate; INS No. 331(iii)

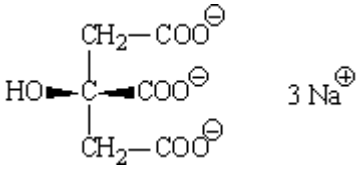
DEFINITION

Chemical names: Trisodium citrate, trisodium salt of 2-hydroxy-1,2,3- propanetricarboxylic acid, trisodium salt of ß-hydroxy-tricarballylic acid

C.A.S. number: 68-04-2

Chemical formula: Anhydrous: $C_6H_5Na_3O_7$
Hydrated: $C_6H_5Na_3O_7 \cdot xH_2O$

Structural formula:



Formula weight: 258.07 (anhydrous)

Assay: Not less than 99.0% calculated on the dried basis

DESCRIPTION Colourless, odourless crystals, or white, crystalline powder; hydrated forms available include the dihydrate and the pentahemihydrate

FUNCTIONAL USES Buffer, sequestrant, emulsion stabilizer

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4): Freely soluble in water, insoluble in ethanol

Test for citrate: To 5 ml of a 1 in 10 solution of the sample add 1 ml of calcium chloride TS and 3 drops of bromothymol blue TS, and slightly acidify with dilute hydrochloric acid TS. Add sodium hydroxide TS until the colour changes to a clear blue, then boil the solution for 3 min, agitating gently during the heating period. A white, crystalline precipitate appears which is insoluble in sodium hydroxide TS but dissolves in acetic acid TS.

To 10 ml of a 1 in 10 solution of the sample add 1 ml of mercuric sulfate TS. Heat the mixture to boiling and add a few drops of potassium permanganate TS. A white precipitate is formed.

Test for sodium — To 5 ml of a 1 in 20 solution of the sample, acidified with acetic acid TS add 1 ml of uranyl zinc acetate TS. A yellow crystalline precipitate is formed within a few min.

PURITY

Loss on drying (Vol. 4) — Anhydrous: not more than 1% (180° to constant weight)
Dihydrate: not more than 13% (180° to constant weight)
Pentahemihydrate: not more than 30% (180° to constant weight)

Alkalinity — A 1 in 20 solution of the sample is alkaline to litmus. After the addition of 0.2 ml of 0.1 N sulfuric acid and 1 drop of phenolphthalein TS to 10 ml of the solution no pink colour is produced.

Oxalate — To 10 ml of a 1 in 10 solution of the sample add 5 drops of dilute acetic acid TS and 2 ml of calcium chloride TS. No turbidity develops within 1 h.

Lead (Vol. 4) — Not more than 2 mg/kg
Determine using an atomic absorption technique appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the method described in Volume 4, “Instrumental Methods.”

METHOD OF ASSAY — Transfer about 350 mg of the sample, accurately weighed, to a 250-ml beaker. Add 100 ml of glacial acetic acid, stir until completely dissolved, and titrate with 0.1 N perchloric acid, using crystal violet TS as indicator. Perform a blank determination and make any necessary correction. Each ml of 0.1 N perchloric acid is equivalent to 8.602 mg of $C_6H_5Na_3O_7$.