TRIETHYL CITRATE

Prepared at the 28th JECFA (1984), published in FNP 31/2 (1984) and in FNP 52 (1992). Metals and arsenic specifications revised at the 61st JECFA (2003). An ADI of 0-20 mg/kg bw was established at the 28th JECFA (1984).

SYNONYMS Ethyl citrate; INS No. 1505

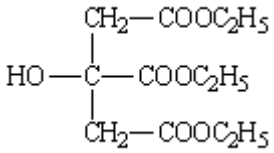
DEFINITION

Chemical names: Triethyl 2-hydroxypropan-1,2,3-tricarboxylate

C.A.S. number: 77-93-0

Chemical formula: $C_{12}H_{20}O_7$

Structural formula:



Formula weight: 276.29

Assay: Not less than 99% w/w

DESCRIPTION Odourless, practically colourless, oily liquid

FUNCTIONAL USES Carrier solvent, sequestrant

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4): Slightly soluble in water; miscible with ethanol and ether

Refractive index (Vol. 4): n (20, D):1.439 - 1.441

Specific gravity (Vol. 4): d (25, 25): 1.135 - 1.139

PURITY

Water (Vol. 4): Not more than 0.25% w/w (Karl Fischer Method)

Acidity: Not more than 0.02% w/w (as citric acid)
Dissolve 32 g of the sample, accurately weighted, in 30 ml of neutralized ethanol, add phenolphthalein TS, and titrate with 0.1 N sodium hydroxide. Not more than 1.0 ml is required.

Lead (Vol. 4): Not more than 2 mg/kg
Determine using an AAS/ICP-AES technique appropriate to the

specified level. The selection of sample size and method of sample preparation may be based on principles of methods described in Volume 4 (under “General Methods, Metallic Impurities”).

METHOD OF ASSAY

Weigh accurately about 1.5 g of the sample into a 500-ml flask equipped with a standard taper ground joint, and add 25 ml of isopropanol and 25 ml of water. Pipet 50 ml of 0.5 N sodium hydroxide into the mixture, add a few boiling chips, and attach a suitable water-cooled condenser. Reflux for 1.5 h, then cool, wash down the condenser with about 20 ml of water, add 5 drops of bromothymol blue TS, and titrate the excess alkali with 0.5 N sulfuric acid. Perform a blank determination. Each ml of 0.5 N sulfuric acid is equivalent to 46.05 mg of $C_{12}H_{20}O_7$.