CALCIUM ACETATE

Prepared at the 17th JECFA (1973), published in FNP 4 (1978) and in FNP 52 (1992). Metals and arsenic specifications revised at the 63rd JECFA (2004). An ADI 'not limited' was established at the 17th JECFA (1973)

SYNONYMS INS No. 263

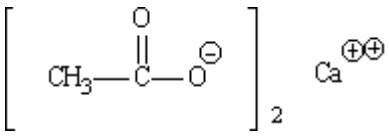
DEFINITION

Chemical names: Calcium acetate

C.A.S. number: 62-54-4

Chemical formula: Anhydrous: $C_4H_6CaO_4$
Hydrates: $C_4H_6CaO_4 \cdot H_2O$; $C_4H_6CaO_4 \cdot xH_2O$ ($x < 1$)

Structural formula:



Formula weight: Anhydrous: 158.17; Monohydrate: 176.18

Assay: Not less than 98% after drying

DESCRIPTION White, hygroscopic, bulky, crystalline solid; a slight odour of acetic acid may be present; the monohydrate may be needles, granules or powder.

FUNCTIONAL USES Antimold and antirope agent, stabilizer, buffer

CHARACTERISTICS

IDENTIFICATION

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

Test for acetate (Vol. 4): Passes test

Test for calcium (Vol. 4): Passes test

PURITY

Loss on drying (Vol. 4): Not more than 11% (155° to constant weight; monohydrate)

pH (Vol. 4): 6 - 9 (1 in 10 soln)

Water insolubles: Not more than 0.3%
Dissolve 10 g of the sample, weighed to the nearest mg, in 100 ml of hot water. Filter through a Gooch crucible, tared to an accuracy of ±0.2 mg, and wash any residue with water. Dry the crucible for 2 h at 105°. Cool, weigh and calculate as percentage. (The weight of the dried residue should not exceed 30 mg).

Formic acid and oxidizable impurities

Not more than traces

Dissolve 1 g of the sample in 5 ml of water. Add 2.5 ml of 0.1 N potassium dichromate and 6 ml of sulfuric acid and allow to stand for 1 min. Add 20 ml of water, cool to 15° and add 1 ml of potassium iodide TS. A faint yellow or brown colour should be produced immediately.

Aldehydes

Not more than traces

Dissolve 2 g of the sample in 10 ml of water and distil. To the first 5 ml of the distillate, add 10 ml of mercuric chloride TS and make alkaline with N sodium hydroxide. Allow to stand for 5 min, and acidify with dilute sulfuric acid TS. The solution should show no more than a faint turbidity.

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

1.Calcium content:

Dissolve in a beaker 2.5 g of the sample, weighed to the nearest mg, in 5 ml of hot dilute hydrochloric acid TS. Cool, transfer to a 250-ml volumetric flask, dilute to volume with water, and mix. Transfer 50 ml of the solution to a 400-ml beaker, add 100 ml of water, 25 ml of sodium hydroxide TS, 40 mg of murexide indicator preparation (an alternative indicator is hydroxynaphtol blue, of which 0.25 g is used - in this case the naphthol green TS is omitted), and 3 ml of naphthol green TS. Titrate with 0.05 M disodium ethylenediamine-tetraacetate until the solution is deep blue in colour. Each ml of 0.05 M disodium ethylenediaminetetraacetate is equivalent to 7.909 mg of $C_4H_6CaO_4$.

2. Acid content:

Half fill a chromatographic column (1.5 cm in diameter, 20 cm long) with a strong cation-exchange resin (Amberlite IR 120, Amberlite IR 100, Duolit C III, Dorvex 50, Lewatit KS, Ion Exchanger I Merck). Add 0.1 N hydrochloric acid through the top of the column, with the outflow orifice closed until the resin is completely covered and let stand 1-2 h. Drain the acid and rinse the column with water (about 1 liter) until 20 ml of eluate forms a red colour, when one drop each of 0.02 N sodium hydroxide and phenolphthalein TS is added. Weigh, to the nearest mg, 0.05 g of the sample, previously dried at 155° to constant weight, into a flask. Dissolve in 15 ml of water and pour slowly on to the column. Wash the flask and the column with about 200 ml of water and collect the total filtrate in a conical flask. Add two drops of phenolphthalein TS and titrate with 0.1 N sodium hydroxide using a microburette. Each ml of 0.1 N sodium hydroxide is equivalent to 7.909 mg of $C_4H_6CaO_4$.