CALCIUM DIHYDROGEN PHOSPHATE

Prepared at the 46th JECFA (1996), published in FNP 52 Add 4 (1996) superseding specifications prepared at the 9th JECFA (1965), published in NMRS 40ABC (1967) and in FNP 52 (1992). Metals and arsenic specifications revised at the 59th JECFA (2002). A group MTDI of 70 mg/kg bw, as phosphorus from all food sources, was established at the 26th JECFA (1982)

SYNONYMS Monobasic calcium phosphate, monocalcium orthophosphate, monocalcium phosphate, calcium biphosphate, acid calcium phosphate, INS No. 341(i)

DEFINITION

Chemical names	Calcium dihydrogen phosphate
C.A.S. number	Anhydrous: 7758-23-8 Monohydrate: 10031-30-8
Chemical formula	Anhydrous: $Ca(H_2PO_4)_2$ Monohydrate: $Ca(H_2PO_4)_2,H_2O$
Formula weight	Anhydrous: 234.05 Monohydrate: 252.07
Assay	Anhydrous: Not less than 16.8% and not more than 18.3% of Ca Monohydrate: Not less than 15.9% and not more than 17.7% of Ca

DESCRIPTION Hygroscopic white crystals or granules, or granular powder

FUNCTIONAL USES Buffering agent, firming agent, sequestrant, leavening agent, dough conditioner, texturizer, yeast food, and nutrient

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4)	Sparingly soluble in water, insoluble in ethanol
Test for calcium (Vol. 4)	Passes test
Test for phosphate (Vol. 4)	Passes test

PURITY

Loss on drying (Vol. 4)	Monohydrate: Not more than 1% (60^o, 3 h)
Loss on ignition (Vol. 4)	Anhydrous: Between 14.0 and 15.5% (800^o, 30 min)
Fluoride (Vol. 4)	Not more than 50 mg/kg Anhydrous: Determine as directed in Method II Monohydrate: Proceed as directed under Method IV

Arsenic (Vol. 4) — Not more than 3 mg/kg (Method II)

Lead (Vol. 4) — Not more than 4 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

Weigh accurately a portion of the sample equivalent to about 475 mg of the anhydrous salt and dissolve it in 10 ml of hydrochloric acid TS. Add a few drops of methyl orange TS, and boil for 5 min, keeping the volume and pH of the solution constant during the boiling period by adding hydrochloric acid or water, if necessary. Add 2 drops of methyl red TS and 30 ml of ammonium oxalate TS, then add dropwise, with constant stirring, a mixture of equal volumes of 6N ammonia solution and water until the pink colour of the indicator just disappears. Digest on a steam bath for 30 min, cool to room temperature, allow the precipitate to settle, and filter the supernatant liquid through a sintered-glass crucible, using gentle suction. Wash the precipitate in the beaker with about 30 ml of cold (below 200) wash solution, prepared by diluting 10 ml of ammonium oxalate TS to 1000 ml. Allow the precipitate to settle, and pour the supernatant liquid through the filter. Repeat this washing by decantation three more times. Using the wash solution, transfer the precipitate as completely as possible to the filter. Finally, wash the beaker and the filter with two 10 ml portions of cold (below 200C) water. Place the sintered-glass crucible in the beaker, and add 100 ml of water and 50 ml of cold dilute sulfuric acid (1 in 6). Add from a buret 35 ml of 0.1N potassium permanganate, and stir until the colour disappears. Heat to about 700, and complete the titration with 0.1N potassium permanganate. Each ml of 0.1N potassium permanganate is equivalent to 2.004 mg of Ca.