POTASSIUM DIHYDROGEN PHOSPHATE

Prepared at the 19th JECFA (1975), published in NMRS 55B (1976) and in FNP 52 (1992). Metals and arsenic specifications revised at the 63rd JECFA (2004). No ADI was established, but a group MTDI of 70 mg/kg bw, expressed as phosphorus from all food sources, was established at the 26th JECFA (1982).

SYNONYMS Monobasic potassium phosphate, monopotassium monophosphate potassium acid phosphate, potassium biphosphate; INS No. 340(i)

DEFINITION

Chemical names	Potassium dihydrogenphosphate, monopotassium dihydrogen-orthophosphate, monopotassium dihydrogen monophosphate
C.A.S. number	7778-77-0
Chemical formula	KH_2PO_4
Formula weight	136.09
Assay	Not less than 98.0% after drying

DESCRIPTION Odourless, colourless crystals or white granular or crystalline powder

FUNCTIONAL USES Buffer, neutralizing agent, sequestrant, yeast food

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4)	Freely soluble in water; insoluble in ethanol
pH (Vol. 4)	4.2 - 4.7 (1 in 100 soln)
Test for potassium (Vol. 4)	Passes test
Test for phosphate (Vol. 4)	Passes test
Test for orthophosphate	To 5 ml of a 1 in 100 soln of the sample, add silver nitrate TS. A yellow precipitate is obtained.

PURITY

Loss on drying (Vol. 4)	Not more than 2% (105°, 4 h)
Water insoluble substances (Vol. 4)	Not more than 0.2%
Fluoride	Not more than 10 mg/kg See description under TESTS

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.”

TESTS

PURITY TESTS

Fluoride

Place 5 g of the sample, 25 ml of water, 50 ml of perchloric acid, 5 drops of silver nitrate solution (1 in 2), and a few glass beads in a 250-ml distilling flask connected with a condenser and carrying a thermometer and a capillary tube, both of which must extend into the liquid. Connect a small dropping funnel, filled with water, or a steam generator, to the capillary tube. Support the flask on an asbestos mat with a hole which exposes about one-third of the flask to the flame. Distil into a 250-ml flask until the temperature reaches 135^{o}. Add water from the funnel or introduce steam through the capillary to maintain the temperature between 135^{o} and 140^{o}. Continue the distillation until 225-240 ml has been collected, then dilute to 250 ml with water, and mix. Place a 50-ml aliquot of this solution in a 100-ml Nessler tube. In another similar Nessler tube place 50 ml of water as a control. Add to each tube 0.1 ml of a filtered solution of sodium alizarinsulfonate (1 in 1000) and 1 ml of freshly prepared hydroxylamine solution (1 in 4000), and mix well. Add, dropwise, and with stirring, 0.05 N sodium hydroxide to the tube containing the distillate until its colour just matches that of the control, which is faintly pink. Then add to each tube exactly 1 ml of 0.1 N hydrochloric acid, and mix well. From a buret, graduated in 0.05 ml, add slowly to the tube containing the distillate enough thorium nitrate solution (1 in 4000) so that, after mixing, the colour of the liquid just changes to a faint pink. Note the volume of the solution added, add exactly the same volume to the control, and mix. Now add to the control sodium fluoride TS (10 µg F per ml) from a buret to make the colours of the two tubes match after dilution to the same volume. Mix well, and allow all air bubbles to escape before making the final colour comparison. Check the end-point by adding 1 or 2 drops of sodium fluoride TS to the control. A distinct change in colour should take place. Note the volume of sodium fluoride added. The volume of sodium fluoride TS required for the control solution should not exceed 1 ml.

METHOD OF ASSAY

Transfer about 5 g of the dried sample, accurately weighed, into a 250-ml beaker. Add 100 ml of water and 5 ml of 1 N hydrochloric acid, and stir until the sample is completely dissolved. Place the electrodes of a suitable pH meter in the solution, and slowly titrate the excess acid, stirring constantly, with 1 N sodium hydroxide to the inflection point occurring at about pH 4. Record the buret reading, and calculate the volume (A), if any, of 1 N hydrochloric acid consumed by the sample. Continue the titration with 1 N sodium hydroxide until the inflection point occurring at about pH 8.8 is reached, record the buret reading, and calculate the volume (B) of 1 N sodium hydroxide required in the titration between the two inflection

points (pH 4 and pH 8.8). Each ml of the volume (B) - (A) of 1 N sodium hydroxide is equivalent to 136.1 mg of KH_2PO_4.