FERROUS AMMONIUM PHOSPHATE

New specifications prepared at the 71st JECFA (2009) and published in FAO JECFA Monographs 7 (2009). A PMTDI of 0.8 mg/kg bw for iron was established at the 35th JECFA (1989).

SYNONYMS Iron(II) ammonium phosphate; Phosphoric acid, ammonium iron (II) salt

DEFINITION Ferrous ammonium phosphate is manufactured by first combining iron powder and phosphoric acid in deionized water with stirring and heating the mixture to get ferrous hydrogen phosphate as a slurry. Ammonia is added to get ferrous ammonium phosphate. The product is then spray dried and milled. Ferrous ammonium phosphate consists primarily of the anhydrous salt with small amounts of the hydrate.

C.A.S. number 10101-60-7

Chemical formula $FeNH_4PO_4$

Formula weight 168.85 anhydrous

Assay Not less than 24 % and not more than 30% expressed as Iron(II)

DESCRIPTION Greyish-green powder

FUNCTIONAL USES Nutrient supplement

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4) Insoluble in water, soluble in dilute mineral acids

Iron (Vol. 4) Passes test

Ammonium (Vol. 4) Passes test

Phosphate (Vol. 4) Passes test

PURITY

Water (Vol. 4) Not more than 3% (Karl Fischer method)

Fluoride (Vol. 4) Not more than 50 mg/kg (Method I or II)

Iron (III) Not more than 7%
See description under TESTS

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”).

Mercury (Vol. 4)

Not more than 1 mg/kg
Determine using cold vapour atomic absorption technique. The selection of sample size and method of sample preparation may be based on the principles of the method described in Volume 4 (under “General Methods, Metallic Impurities”).

Cadmium (Vol. 4)

Not more than 1 mg/kg
Determine using AAS/ICP-AES 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 (under “General Methods, Metallic Impurities”).

Arsenic (Vol. 4)

Not more than 3 mg/kg (Method II)
Determine using atomic absorption hydride technique. Use Method I for sample preparation.

TESTS

PURITY TESTS

Iron (III)

Transfer 1 g of sample into a 250 ml Erlenmeyer flask, add 20 ml of water, 10 ml of hydrochloric acid TS, heat to dissolve and cool to room temperature. Add 3 g of potassium iodide, stopper, swirl to mix, and allow to stand in the dark for 15 min. Remove the stopper, add approx. 100 ml of water, and titrate with 0.1 N sodium thiosulfate, adding starch TS near the end point. Each ml of 0.1 N sodium thiosulfate is equivalent to 5.585 mg of iron (III).

METHOD OF ASSAY

Weigh accurately about 0.3 g of the sample into a 250 ml conical flask, add 25 ml of dilute sulfuric acid (16% v/v) and dissolve with heating. Cool and add 75 ml of water. Add 0.1 ml of ferroin indicator solution (0.1% w/v in water). Titrate immediately with 0.1 N cerium sulfate until the colour changes from orange to light bluish-green. Each ml of 0.1 N cerium sulfate is equivalent to 5.585 mg of iron (II).