MONOMAGNESIUM PHOSPHATE

Prepared at the 69th JECFA (2008), published in FAO JECFA Monographs 5 (2008), based on the previously withdrawn tentative specifications prepared at the 61st JECFA and published in FNP 52, Add 11 (2003). A group MTDI of 70 mg/kg bw, expressed as phosphorus from all food sources, was established at the 26th JECFA (1982).

SYNONYMS Monomagnesium orthophosphate, Magnesium dihydrogen phosphate; Magnesium phosphate, monobasic; Magnesium biphosphate; Acid magnesium phosphate; INS No. 343(i)

DEFINITION Monomagnesium phosphate is manufactured by partial neutralization of phosphoric acid with magnesium oxide and drying of the resultant product.

Chemical names: Monomagnesium dihydrogen phosphate

C.A.S. number: 13092-66-5 (Anhydrous)
15609-87-7 (Dihydrate)

Chemical formula: $Mg(H_2PO_4)_2 \cdot x\ H_2O$ (x = 0 to 4)

Formula weight: 218.3 (Anhydrous)
254.3 (Dihydrate)
290.3 (Tetrahydrate)

Assay: Not less than 96% and not more than 102% as $Mg_2P_2O_7$ on the ignited basis

DESCRIPTION White, odourless, crystalline powder

FUNCTIONAL USES Acidity regulator, nutrient

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4): Slightly soluble in water

Magnesium (Vol. 4): Passes test

Phosphate (Vol. 4): Passes test

PURITY

Loss on drying (Vol. 4): Anhydrous: Not more than 1.5 % (105°, 4 h)

Loss on ignition (Vol. 4): Anhydrous: Not more than 18.5 %
Dihydrate: Not more than 33 %
Tetrahydrate: Not more than 43%

Accurately weigh about 2 g of sample, and ignite, preferably in a muffle furnace at about 800° for 30 min. Allow the crucible to cool in a desiccator to constant weight. Save the residue for the Assay.

Fluoride (Vol. 4)

Not more than 10 mg/kg
See description under TESTS

Arsenic (Vol. 4)

Not more than 3 mg/kg
Determine by the atomic absorption hydride technique. The selection of sample size and method of sample preparation may be based on the principles of the methods described in Volume 4 (under “General Methods, Metallic Impurities”).

Lead (Vol. 4)

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

TESTS

PURITY TESTS

Fluoride (Vol. 4)

Use Method III. The standard curve constructed in Method III may not be suitable for samples containing low fluoride levels. Therefore, it will be necessary to prepare standard solutions with concentrations other than those specified for Method III for the construction of a standard curve and to choose a sample size that will bring the fluoride concentration within the standard curve.

METHOD OF ASSAY

Accurately weigh 200 mg of the residue obtained in the test for Loss on ignition in a high 250 ml beaker. Dissolve the residue in 2 ml of hydrochloric acid (16 %) and add 100 ml of water. Heat the solution to 50° to 60° and add 10 ml of 0.1 M disodium EDTA from a buret. Add a magnetic stirring bar and, while stirring, adjust with 1 N sodium hydroxide to pH 10. Add 10 ml of ammonia-ammonium chloride buffer TS (Vol. 4), 12 drops of Eriochrome black TS and continue the titration with 0.1 M disodium EDTA until the red colour changes to green. [NOTE: The solution must be clear when the end point is reached] Calculate the weight (mg) of $Mg_2P_2O_7$ in the residue taken by the formula

$$9.14 \times V$$

where V is the volume (ml) of 0.1 M disodium EDTA required in the titration.