

SODIUM ALUMINIUM PHOSPHATE, ACIDIC

Prepared at the 29th JECFA (1985), published in FNP 34 (1986) and in FNP 52 (1992). Metals and arsenic specifications revised at the 61st JECFA (2003). A PTWI of 7 mg/kg bw for aluminium and its salts was established at the 33rd JECFA (1988)

SYNONYMS SALP, INS No. 541(i)

DEFINITION

Chemical names Sodium trialuminium tetradecahydrogen octaphosphate tetrahydrate or trisodium dialuminium pentadecahydrogen octaphosphate

Chemical formula $\text{NaAl}_3\text{H}_{14}(\text{PO}_4)_8 \cdot 4\text{H}_2\text{O}$
 $\text{Na}_3\text{Al}_2\text{H}_{15}(\text{PO}_4)_8$

Formula weight $\text{NaAl}_3\text{H}_{14}(\text{PO}_4)_8 \cdot 4\text{H}_2\text{O}$: 949.88
 $\text{Na}_3\text{Al}_2\text{H}_{15}(\text{PO}_4)_8$: 897.82

Assay Not less than 95% of $\text{NaAl}_3\text{H}_{14}(\text{PO}_4)_8 \cdot 4\text{H}_2\text{O}$ or not less than 95% of $\text{Na}_3\text{Al}_2\text{H}_{15}(\text{PO}_4)_8$

DESCRIPTION White, odourless powder

FUNCTIONAL USES Raising agent

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4) Insoluble in water; soluble in hydrochloric acid

pH (Vol. 4) Acid to litmus

Test for aluminium (Vol. 4) Passes test
Test a 1 in 10 solution in dilute hydrochloric acid (1 in 2)

Test for sodium (Vol. 4) Passes test
Test a 1 in 10 solution in dilute hydrochloric acid (1 in 2)

Test for phosphate (Vol. 4) Passes test
Test a 1 in 10 solution in dilute hydrochloric acid (1 in 2)

PURITY

Loss on ignition (Vol. 4) $\text{NaAl}_3\text{H}_{14}(\text{PO}_4)_8 \cdot 4\text{H}_2\text{O}$: 19.5 - 21% (750-800°, 2 h)
 $\text{Na}_3\text{Al}_2\text{H}_{15}(\text{PO}_4)_8$: 15 - 16% (750-800°, 2 h)

Fluoride (Vol. 4) Not more than 25 mg/kg (Method I)

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

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

Transfer about 2.5 g of the sample, accurately weighed, into a 250-ml volumetric flask, add 15 ml of hydrochloric acid and one glass bead, and boil gently for about 5 min. Cool, dilute to volume with water, and mix. Transfer 10 ml of this solution to a 250-ml beaker, add phenolphthalein TS, and neutralize with ammonia TS. Add dilute hydrochloric acid (1 in 2) until the precipitate just dissolves, then dilute to 100 ml with water, and heat to 70-80°. Add 10 ml of 8-hydroxyquinoline TS and sufficient ammonium acetate TS until a yellow precipitate forms, then add 30 ml in excess. Digest at 70° for 30 min, filter through a previously dried and weighed crucible, and wash thoroughly with hot water. Dry at 105° for 2 h, cool, and weigh.

Each mg of the precipitate so obtained corresponds to 0.689 mg of $\text{NaAl}_3\text{H}_{14}(\text{PO}_4)_8 \cdot 4\text{H}_2\text{O}$, or to 0.977 mg of $\text{Na}_3\text{Al}_2\text{H}_{15}(\text{PO}_4)_8$.