

## SODIUM ALUMINIUM PHOSPHATE, ACIDIC

*Prepared at the 61<sup>st</sup> JECFA (2003) and published in the Combined Compendium of Food Additive Specifications, FAO JECFA Monographs 1 (2005). A PTWI of 2 mg/kg bw for aluminium was established at the 74<sup>th</sup> JECFA (2011).*

### SYNONYMS

SALP; INS No. 541(i)

### Chemical names

Sodium trialuminium tetradecahydrogen octaphosphate tetrahydrate;  
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 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 methods described in Volume 4 (under "General Methods, Metallic Impurities").

#### **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  $\text{Na}_3\text{Al}_2\text{H}_{15}(\text{PO}_4)_8$ .