Aluminium sulfate (Aluminii sulfas)

$Al_2(SO_4)_3,nH_2O$

Relative molecular mass. 342.1 (anhydrous).

Chemical name. Aluminium sulfate (2:3); CAS Reg. No. 10043-01-3 (anhydrous). Aluminium sulfate (2:3) hydrate; CAS Reg. No. 17927-65-0 (hydrate).

Description. Colourless, lustrous crystals or crystalline masses, or a white, crystalline powder; odourless.

Solubility. Soluble in cold water; freely soluble in hot water; practically insoluble in ethanol (~750 g/l) TS.

Category. Astringent drug; used in the preparation of aluminium acetate solution.

Storage. Aluminium sulfate should be kept in a well-closed container.

Aluminium sulfate contains a variable quantity of water of crystallization.

Requirements

Aluminium sulfate contains not less than **51.0%** and not more than the equivalent of **59.0%** of $Al_2(SO_4)_3$.

Identity tests

A. Dissolve 0.2 g in 2 mL of water and add 0.5 mL of hydrochloric acid (~70 g/l) TS and 0.5 mL of alkaline thioacetamide TS; no precipitate is formed. Add drop by drop sodium hydroxide (~80 g/l) TS; a white, gelatinous precipitate is formed which dissolves on further addition of sodium hydroxide. Gradually add ammonium chloride (100 g/l) TS; a white, gelatinous precipitate reappears.

B. A 0.1 g/mL solution yields reaction A described under 2.1 General identification tests as characteristic of sulfates.

Heavy metals. Use 1.0 g for the preparation of the test solution as described under 2.2.3 Limit test for heavy metals, Procedure 1; determine the heavy metals content according to Method A; not more than 50 µg/g.

Ammonium salts. Heat 1 g with 10 mL of sodium hydroxide (1 mol/l) VS on a water-bath for 1 minute; no odour of ammonia is perceptible.

Iron. Use 0.4 g; the solution complies with the 2.2.4 Limit test for iron; not more than 100 µg/g.

Alkali and alkaline-earth metals. Dissolve 1.0 g in 100 mL of water, heat, and add 0.1 mL of methyl red/ethanol TS and sufficient ammonia (~100 g/l) TS until the colour of the solution changes to yellow. Dilute to 150 mL with water, heat to boiling, and filter. Evaporate 75 mL of the filtrate to dryness on a water-bath and ignite to constant mass; the residue weighs not more than 2 mg (0.4%).

Colour and clarity of solution. A solution of 0.50 g in 10 mL of water is colourless and not more opalescent than opalescence standard TS2.

pH value. pH of a 20 mg/mL solution in carbon-dioxide-free water R, 2.5-4.0.

Assay. Dissolve about 0.5 g, accurately weighed, in 20 mL of water, and proceed as described under 2.5 Complexometric titrations for aluminium.

Each mL of disodium edetate (0.05 mol/l) VS is equivalent to 8.554 mg of $Al_2(SO_4)_3$.