Silver nitrate (Argenti nitras)

Molecular formula. AgNO₃

Relative molecular mass. 169.9

Chemical name. Silver(1+) nitrate; CAS Reg. No. 7761-88-8.

Description. Colourless or white crystals or white cylindrical rods; odourless.

Solubility. Soluble in 0.5 parts of water; soluble in ethanol (~750 g/l) TS.

Category. Antiinfective agent.

Storage. Silver nitrate should be kept in a tightly closed, non-metallic container, protected from light.

Additional information. Even in the absence of light, Silver nitrate is gradually degraded on exposure to a humid atmosphere, the decomposition being faster at higher temperatures. On exposure to light and in the presence of organic matter, it becomes grey or greyish black.

Requirements

Definition. Silver nitrate contains not less than 99.0% and not more than 100.5% of AgNO₃.

Identity tests

A. Dissolve 20 mg in 1.0 mL of water, add ammonia (~100 g/l) TS, drop by drop, until the precipitate first formed just dissolves; add about 0.1 mL of formaldehyde TS and warm the mixture; glossy metallic silver forms on the wall of the test-tube.

B. Dissolve 20 mg in 1.0 mL of water and add a few drops of potassium iodide (~80 g/l) TS; a cream-coloured precipitate is produced which is insoluble in ammonia (~100 g/l) TS and nitric acid (~1000 g/l) TS.

C. To 2 mL of a 0.05 g/mL solution add 2 mL of ferrous sulfate (15 g/l) TS; it yields reaction A described under 2.1 General identification tests as characteristic of nitrates.

Clarity and colour. A solution of 0.4 g in 10 mL of water is clear and colourless.

Acidity or alkalinity. Dissolve 0.4 g in 10 mL of water; to a 2-mL portion add 0.1 mL of bromocresol green/ethanol TS; the colour of the solution is blue. To another 2-mL portion of the test solution add 0.1 mL of phenol red/ethanol TS; the colour of the solution is yellow.

Foreign salts. Dissolve 1.2 g in 30 mL of water, add 7.5 mL of hydrochloric acid (~70 g/l) TS, shake vigorously, heat on a water-bath for 5 minutes and filter. Evaporate 20 mL of the filtrate to dryness on a water-bath and dry at 105 °C; the residue weighs not more than 2.0 mg.

Bismuth, copper, and lead. Dissolve 1.0 g in 5 mL of water, add drop by drop ammonia (~100 g/l) TS until the precipitate first formed just dissolves; the solution is clear and colourless.

Assay. Dissolve about 0.3 g, accurately weighed, in 50 mL of water, add 2 mL of nitric acid (~130 g/l) TS and 4 mL of ferric ammonium sulfate (45 g/l) TS. Titrate with ammonium thiocyanate (0.1 mol/l) VS until a reddish yellow colour is produced. Each mL of ammonium thiocyanate (0.1 mol/l) VS is equivalent to 16.99 mg of AgNO₃.