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Aluminum Chloride

$AlCl_3 \cdot 6H_2O$ 241.43
$AlCl_3$ 133.34
Aluminum chloride, hexahydrate;
Aluminum chloride hexahydrate CAS RN®: 7784-13-6; UNII: 3CYT62D3GA.
Anhydrous CAS RN®: 7446-70-0; UNII: LIF1N9568Y.

DEFINITION

Aluminum Chloride contains NLT 95.0% and NMT 102.0% of aluminum chloride ($AlCl_3$), calculated on the anhydrous basis.

IDENTIFICATION

• **A. Identification Tests—General, *Aluminum*⟨191⟩and*Chloride*⟨191⟩**
Sample solution: 100 mg/mL
Acceptance criteria: Meets the requirements

ASSAY

• **Procedure**
Edetate disodium titrant: Prepare and standardize as directed in *Reagents*, *Volumetric Solutions*, *Edetate Disodium, Twentieth-Molar (0.05 M)*.
Sample solution: 20 mg/mL of aluminum chloride in water
Titrimetric system
Mode: Back-titration
Titrant: 0.05 M zinc sulfate VS
Endpoint detection: Visual
Analysis: Transfer 10.0 mL of the *Sample solution* into a 250-mL beaker, and add, in the order named and with continuous stirring, 25.0 mL of *Edetate disodium titrant* and 20 mL of acetic acid–ammonium acetate buffer TS, and boil gently for 5 min. Cool, and add 50 mL of alcohol and 2 mL of dithizone TS. Titrate the excess edetate disodium with *Titrant* to a bright rose-pink color. Perform a blank determination, substituting 10 mL of water for the *Sample solution*, and make any necessary correction. Each mL of *Edetate disodium titrant* consumed is equivalent to 6.667 mg of aluminum chloride ($AlCl_3$).
Acceptance criteria: 95.0%–102.0% on the anhydrous basis

IMPURITIES

• **Limit of Sulfate**
Sample solution: 10 mg/mL
Analysis: Add 0.2 mL of barium chloride TS to 10 mL of the *Sample solution*.
Acceptance criteria: No turbidity is produced within 1 min.
• **Iron ⟨241⟩**
Sample: 1.0 g
Analysis: Dissolve the *Sample* in 45 mL of water, and add 2 mL of hydrochloric acid.
Acceptance criteria: NMT 10 ppm
• **Limit of Alkalies and Alkaline Earths**
Sample: 1.0 g
Analysis: To a boiling solution of the *Sample* in 150 mL of water add a few drops of methyl red TS, then add 6 N ammonium hydroxide until the color of the solution just changes to a distinct yellow. Add hot water to restore the volume to 150 mL, and filter while hot. Evaporate 75 mL of the filtrate to dryness, and ignite to a constant weight.
Acceptance criteria: 0.5%; the weight of the residue is NMT 2.5 mg.

SPECIFIC TESTS

• **Water Determination, *Method I* ⟨921⟩:** 42.0%–48.0%

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in tight containers.

Auxiliary Information - Please check for your question in the FAQs before contacting USP.

Topic/Question	Contact	Expert Committee
ALUMINUM CHLORIDE	Documentary Standards Support	SM32020 Small Molecules 3

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
Pharmacopeial Forum: Volume No. Information currently unavailable

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