Endpoint detection: Potentiometric

Analysis: Transfer the *Sample* to a 250-mL beaker, and add 100 mL of water and 10 mL of diluted nitric acid with stirring. Titrate with *Titrant*, and determine the endpoint.

Acceptance criteria: Each mL of 0.1 N silver nitrate is equivalent to 3.545 mg of chloride (Cl). Use the chloride content thus obtained to calculate the aluminum/chloride atomic ratio.

- **PROCEDURE 2: CONTENT OF ALUMINUM**

Edetate disodium titrant: Prepare and standardize as directed in *Reagents, Volumetric Solutions, Edetate Disodium, Twentieth-Molar (0.05 M)*, except use 37.2 g of edetate disodium.

Sample solution: *Transfer* 400 mg of Solution to a 250-mL beaker, add 20 mL of water and 5 mL of hydrochloric acid, boil on a hot plate for NLT 5 min, and allow to cool.

Titrimetric system

Mode: Back titration

Titrant: 0.1 M zinc sulfate VS

Endpoint detection: Visual

Analysis: To the *Sample solution* add 25.0 mL of *Edetate disodium titrant*, and adjust with 2.5 N ammonium hydroxide or 1 N acetic acid to a pH of 4.7 ± 0.1. Add 20 mL of acetic acid–ammonium acetate buffer TS, 50 mL of alcohol, and 5 mL of dithizone TS. The pH of this solution should be 4.7 ± 0.1. Titrate excess edetate disodium with *Titrant* until the color changes from green-violet to rose-pink. Perform a blank titration, and make any necessary correction.

Acceptance criteria: Each mL of 0.1 M *Edetate disodium titrant* consumed is equivalent to 2.698 mg of aluminum (Al). Use the aluminum content thus obtained to calculate the aluminum/chloride atomic ratio.

- **PROCEDURE 3: ALUMINUM/CHLORIDE ATOMIC RATIO**

Analysis: Use the percentage of aluminum found in *Content of Aluminum* and the percentage of chloride found in *Content of Chloride*.

Calculate the aluminum/chloride atomic ratio (X) as follows:

$$\text{Result} = (P_{Al}/P_{Cl}) \times (A_{Cl}/A_{Al})$$

P_{Al} = percentage of aluminum found in *Content of Aluminum*

P_{Cl} = percentage of chloride found in *Content of Chloride*

A_{Cl} = atomic weight of chlorine (Cl), 35.453

A_{Al} = atomic weight of aluminum (Al), 26.98

Acceptance criteria: 0.90: 1 to 1.25: 1

- **PROCEDURE 4**

Analysis: Calculate the percentage of the labeled concentration of anhydrous aluminum dichlorohydrate ($Al_y(OH)_{3y-z}Cl_z$) in the portion of Solution taken:

$$\text{Result} = P_{Al} \times \{[A_{Al}X + (M(3X - 1)) + A_{Cl}]/A_{Al}X\}$$

P_{Al} = percentage of aluminum found in *Content of Aluminum*

A_{Al} = atomic weight of aluminum (Al), 26.98

X = aluminum/chloride atomic ratio, as determined in *Aluminum/Chloride Atomic Ratio*

M = molecular weight of the hydroxide anion (OH), 17.01

A_{Cl} = atomic weight of chlorine (Cl), 35.453

Acceptance criteria: 90.0%–110.0%

IMPURITIES

- **ARSENIC,** *Method I* ⟨211⟩: NMT 2 ppm

Delete the following:

- **HEAVY METALS,** *Method I* ⟨231⟩: NMT 10 ppm (Official 1-Jan-2018)
- **LIMIT OF IRON**

Standard preparation: 2.0 mL of *Standard Iron Solution*, prepared as directed in *Iron* ⟨241⟩

Test preparation: Transfer 5.3 g of Solution to a 100-mL volumetric flask, and dilute with water to volume.

Analysis: Transfer 2.0 mL of the *Standard preparation* into a 50-mL beaker. Transfer 5.0 mL of the *Test preparation* into a second 50-mL beaker. To each of the beakers add 5 mL of 6 N nitric acid, cover with a watch glass, and boil on a hot plate for 3–5 min. Allow to cool. Add 5 mL of *Ammonium Thiocyanate Solution*, prepared as directed in *Iron* ⟨241⟩, transfer to separate 50-mL color-comparison tubes, and dilute with water to volume.

Acceptance criteria: 75 ppm; the color of the solution from the *Test preparation* is not darker than that from the *Standard preparation*.

SPECIFIC TESTS

- **pH** ⟨791⟩

Sample solution: Dilute 3 g of Solution with water to 10 mL.

Acceptance criteria: 3.0–5.0

ADDITIONAL REQUIREMENTS

- **PACKAGING AND STORAGE:** *Preserve* in well-closed containers.
- **LABELING:** Label Solution to state the solvent used and the claimed concentration of anhydrous aluminum dichlorohydrate contained therein.

Aluminum Dichlorohydrex Polyethylene Glycol

$Al_y(OH)_{3y-z}Cl_z \cdot nH_2O \cdot mH(OCH_2CH_2)_nOH$

Aluminum chlorohydroxide polyethylene glycol complex.

Aluminum hydroxychloride polyethylene glycol complex.

» Aluminum Dichlorohydrex Polyethylene Glycol consists of aluminum dichlorohydrate in which some of the waters of hydration have been replaced by polyethylene glycol. It encompasses a range of aluminum-to-chloride atomic ratios between 0.90:1 and 1.25:1. It contains not less than 90.0 percent and not more than 110.0 percent of the labeled amount of anhydrous aluminum dichlorohydrate.

Packaging and storage—Preserve in well-closed containers.

Labeling—The label states the content of anhydrous aluminum dichlorohydrate.

Identification—

A: A solution (1 in 10) responds to the tests for *Aluminum* ⟨191⟩ and for *Chloride* ⟨191⟩.

B: *Infrared Absorption* ⟨197F⟩—

Test specimen—Dissolve 0.5 g in about 40 mL of water, and while mixing adjust with 2.5 N sodium hydroxide to a pH of 9.55 ± 0.05. Filter the suspension of precipitate thus